
CALIFORNIA AIRPORTS



**A Study of the
Aeronautical Status of California
With Projections for the Future and
Recommendations for Adequate Development**

STATE OF CALIFORNIA
EARL WARREN, GOVERNOR

A Report Originally Prepared and Published by the
**California State Reconstruction and
Reemployment Commission**

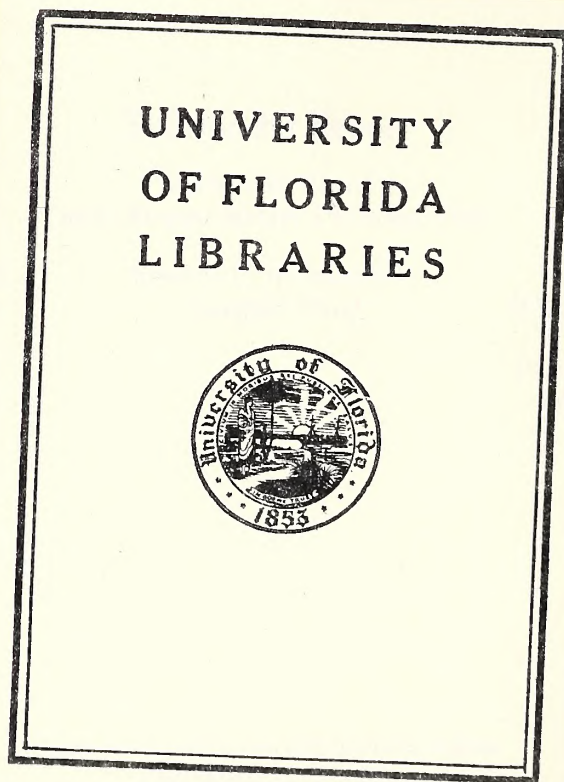
Under the Direction of
A. EARL WASHBURN
Director of Reconstruction and Reemployment

E. W. SCAMMO
Field Assistant

A. E. BOOTHBY
Graphic Artist

L. STOCK
Arch Assistant

VAN DUZER
Statistician




DOCUMENTS SECTION
11th and O Streets, Sacramento 14, California

Price \$5.00, plus tax

CALIFORNIA AIRPORTS

MAY 1947

A Study of the
Aeronautical Status of California With
Projections for the Future and
Recommendations for Adequate Development

A faint, circular library stamp from the University of Illinois is visible on the right side of the page. The text "UNIVERSITY OF ILLINOIS" is curved along the top, and "LIBRARY" is in the center.

SECOND EDITION

PUBLISHED BY THE
CALIFORNIA AERONAUTICS COMMISSION
SACRAMENTO, CALIFORNIA

EARL WARREN
GOVERNOR



629.136
C153c.2

A. EARL WASHBURN
DIRECTOR

STATE OF CALIFORNIA

STATE RECONSTRUCTION AND REEMPLOYMENT COMMISSION

600 STATE BLDG.
SAN FRANCISCO 2

631 J STREET, FIFTH FLOOR
SACRAMENTO 14

600 STATE BLDG.
LOS ANGELES 12

MEMBERS

C. H. PURCELL
CHAIRMAN
DIRECTOR OF PUBLIC WORKS

JAMES S. DEAN
VICE CHAIRMAN
DIRECTOR OF FINANCE

JAMES A. ARNERICH
DIRECTOR OF PROFESSIONAL AND
VOCATIONAL STANDARDS

DR. ROBERT G. SPROUL
PRESIDENT OF THE
UNIVERSITY OF CALIFORNIA

WARREN T. HANNUM
DIRECTOR
OF NATURAL RESOURCES

A. A. BROCK
DIRECTOR OF AGRICULTURE

PAUL SCHARRENBURG
DIRECTOR
OF INDUSTRIAL RELATIONS

ROY E. SIMPSON
SUPERINTENDENT
OF PUBLIC INSTRUCTION

WILLIAM T. SWEIGERT
EXECUTIVE SECRETARY
OF THE GOVERNOR

June 16, 1947

Honorable Earl Warren
Governor of California

The State Reconstruction and Reemployment Commission has authorized the transmittal to you of the enclosed State Master Airport Plan for California.

This study and report has been completed by a special staff under the direction of Colonel Warren E. Carey. The main body of the report and recommendations contained therein are the result of original research and field work never before undertaken. There existed little source material on the subject of airports as directly related to their location in California from an economic viewpoint.

The State Aviation Project Committee, under the Chairmanship of Mr. Loyd Wright of Los Angeles, rendered initial and continued counsel and guidance during the preparation of this report. Their assistance was of immeasurable value.

Respectfully submitted,

STATE RECONSTRUCTION AND
REEMPLOYMENT COMMISSION

A. EARL WASHBURN
Director of Reconstruction
and Reemployment

C. H. PURCELL, Chairman

FOREWORD

Recognizing the importance of aviation to National security and the economic development of the State and Nation, his Excellency, Governor Earl Warren established in his administrative staff, in June, 1946, an Airport Master Planning Unit to foster airport planning in the several political subdivisions of the State and to integrate such local plans into a State Master Plan of Airports.

Because of the urgent need for action, precipitated by the passage of the Federal Airport Act in May, 1946, and the necessity for safe-guarding insofar as possible, the State's large economic interest in aeronautics, the Governor utilized his emergency power to initiate a program having as its objectives the judicious utilization of funds made available for airport construction by the Federal Government, and the absorption into a planned State system the many surplus military airfields made available to cities and counties by the cessation of hostilities. In the absence of any State agency having specific jurisdiction over aeronautics, this new function was established under the State Planning Act of 1929, in the State Reconstruction and Reemployment Commission—successor to the State Planning Board—which agency also has broad responsibility for the orderly transition of the State's economy from a wartime to peacetime basis. Its staff has maintained liaison with all planning commissions and local governments in furtherance of its broad powers, and the special need for airport planning was thus communicated to those most vitally concerned through an educational program of area conferences on appropriate subjects. The selection of this sponsoring agency for the program outlined was particularly appropriate, and recognition is hereby tendered for the invaluable assistance furnished by the members of the Commission and its entire administrative staff.

In urging the communities of California to engage in long range analysis of their airport needs for incorporation into community master plans and into a State system of airports, recognition has been given to the dynamic possibilities of the air age, to its vital effect on world economy and international security, and to the immediate need for planning and building a strong civil

aviation structure, as a continuing asset to commerce, industry and national defense. Much has been accomplished in a few months' time. Many of the cities and counties have recognized their responsibilities and opportunities and are now actively planning and building for the air age. But the pattern is in no sense complete. Other sections of the State most vitally concerned in aeronautical advancement are doing nothing to prepare for future needs.

The problem is vital to all Californians. The State can lead the world in aeronautics and its associated industries if plans are made and action taken to aid its development.

This report is intended to accomplish certain basic purposes. It is, First, a record of the growth of aeronautics indicating the phenomenal development of an infant industry. Second, it is an inventory of existing aviation facilities and an evaluation of their adequacy. Third, it is a projection of aviation trends and requirements in California.

No specific project plans have been undertaken. Rather, it has been the purpose "to specify in terms of general location, and type of development, the projects necessary to anticipate and meet the needs of civil aviation" in California, as required under the Federal Airport Act, through the year 1955.

A Master Plan is never a finished article, but serves best as a basis for continuing study and stage development as needs materialize. It is confidently hoped that this report will form the basis for further, more complete studies of the many problems involved in anticipating the needs of an expanding industry in the most rapidly-growing State.

Planning to be effective must be implemented. Here also enters an entire new chain of problems worthy of continuing study by the best available talent. The important requirements are that all of these problems be solved, that a sound, progressive aviation policy be established, that costly mistakes and delays be eliminated, and that the initial steps be taken to provide the State of California with a comprehensive system of airports adequate to its present and expanding needs.

6-2-49 - Publ. - Gift

ACKNOWLEDGMENT

Grateful acknowledgement is made of the assistance extended by many of the city and county planning agencies throughout the State. Twenty-nine of the fifty-eight counties have contributed some material to this report.

The counsel, aid and factual information furnished by the Sixth Regional Office of the Civil Aeronautics Administration and by its District Airport Engineers and their staffs is deeply appreciated.

The League of California Cities, the County Supervisors Association of California, the California State Chamber of Commerce, the United State Forest Service, various Departments of the California State Government and numerous other agencies have each contributed advice and helpful information.

Throughout the course of this study, the staff has been given excellent cooperation by all who have been contacted.

It is hoped that Aviation will be advanced materially in California as a result of the united efforts represented by this report.

WARREN E. CAREY
Chief, Airport Master Planning Staff

CONTENTS

	Page		Page
FOREWORD	iii	4. Commerce	69
SUMMARY	xiii	5. Human Factors	71
PART I INTRODUCTION		Population	71
1. The Air Age	1	Population Growth	71
2. Aeronautical Progress	1	Population Distribution	78
3. Airports	5	Tourists	82
The Need	5	6. Indices of Purchasing Power	82
A Review of Airport Development	5	Purpose and Method of Selection	82
Government Sponsorship	11	Individual Indices of Purchasing Power	83
War Effect on Airport Development	14	Development of the Buying Potential	95
Public Versus Private Ownership of Airports	15	Index	95
The National Airport Plan and Program	18	PART IV AERONAUTICAL APPRAISAL .. 99	
4. Airport Financing	23	1. Airways System in California	99
Benefits of Adequate Airports and Relationship to Financing	23	2. Airport Inventory	100
Opportunities for Self Support	24	Sources	100
5. Aeronautical Activities	25	Analysis	128
Scheduled Flying	25	War Surplus	144
Non-scheduled Flying	26	Inadequacies of Present Coverage	145
6. Types of Airports	26	3. Scheduled Air Transport	146
Air Transport Terminals	26	Foreign	146
Airports for Non-scheduled Flying	28	Domestic	146
Private Owner Airparks	28	Feeder	152
Intermediate or Emergency Airports	29	4. Non-scheduled Aviation	153
Airports for Helicopters	29	Analysis of Aircraft Ownership	153
Seaplane Bases	30	Present Field of Utility	161
7. The State Master Plan of Airports	31	5. Summary of Aeronautical Appraisal	162
Legal Background	31	PART V AERONAUTICAL PROJECTIONS 165	
Outline of Purposes	31	1. Trends in Aviation Development	165
Community Lethargy	31	Development of Airport Requirements	165
Selection of Aviation Areas	32	Size and Type of Aircraft	175
Treatment by Aviation Areas in Appendices	32	Helicopters	177
Method of Resolving Conclusions	32	All Weather Flying	177
PART II PHYSICAL CHARACTERISTICS OF CALIFORNIA		Population Study As Basis for Projections	180
1. California—The State	35	2. Scheduled Aviation Projection	180
2. Topography	35	Basis for Projections	180
3. Climate	37	Probable Future Stature	182
4. Land Usage	41	3. Non-scheduled Aviation Projection	186
5. Recreational Areas	45	Basis for Projection	186
6. Natural Routes of Travel and Air Routes	51	Probable Future Development	189
7. Relationship to Nation and Orient	55	4. Air Cargo Projection	193
PART III ECONOMIC FACTORS		Air Freight to Date	193
1. Natural Resources	57	Summary of Projections	195
Airplane Forest Patrol	60	California As an Air Freight Market	196
Mining—Geology	62	Examination of Certain Imports and Exports	198
Fisheries	62	Future of Air Freight Traffic	202
2. Agriculture	62	5. Possible Foreign Development	203
3. Industry	65	Special Position of California Ports	203
Industrial Growth of the West	65	Potential Development	204
Occupations	68	Development to Date	205
		The Future of International Air Commerce	209
		PART VI CONCLUSIONS	
		1. Analysis of Area Recommendations	211
		2. Airport Needs of California Cities	216
		3. Airport Needs of Rural Areas	225
		4. Effect of Proposed Development	235

Appendices

	<i>Page No.</i>
Appendix 1—Detailed Treatment of Area 1—San Diego County	239
Appendix 2—Detailed Treatment of Area 2—Los Angeles Metropolitan	253
Appendix 3—Detailed Treatment of Area 3—Desert Region	279
Appendix 4—Detailed Treatment of Area 4—Kern County	289
Appendix 5—Detailed Treatment of Area 5—Mid Coastal Counties.....	299
Appendix 6—Detailed Treatment of Area 6—Fresno Metropolitan	317
Appendix 7—Detailed Treatment of Area 7—Inyo-Mono Counties	333
Appendix 8—Detailed Treatment of Area 8—Stockton Metropolitan	341
Appendix 9—Detailed Treatment of Area 9—San Francisco Bay	355
Appendix 10—Detailed Treatment of Area 10—Sacramento Metropolitan	381
Appendix 11—Detailed Treatment of Area 11—Redwood Empire	399
Appendix 12—Detailed Treatment of Area 12—Chico-Red Bluff	413
Appendix 13—Detailed Treatment of Area 13—Modoc Plateau Region	423
Appendix 14—Detailed Treatment of Area 14—Shasta-Cascade Region	435

Index of Plates

Plate		Page	Plate		Page
A	Relief Map of California-----	Facing Page 1	E	Agricultural Land Use-----	42
	PART I INTRODUCTION		F	Roughness of the Land-----	43
B	California Aviation Areas Delineated--	33	G	Non-Urban Recreational Areas-----	47
	PART II PHYSICAL CHARACTER- ISTICS OF CALIFORNIA		H	State Highway System-----	52
			I	Highway Traffic Flow-----	53
C	California Elevations -----	36		PART III ECONOMIC FACTORS	
D	Climatic Conditions Affecting Airport Design -----	38	J	Distribution of Population -----	75
			K	Population Density by Counties— July, 1946 -----	79
	PART IV AERONAUTICAL APPRAISAL				
L	Pattern of Federal Airways-----				98
M-1	Existing Airports in Area 1—San Diego -----				103
M-2	Existing Airports in Area 2—Los Angeles Metropolitan -----				105
M-3	Existing Airports in Area 3—Desert -----				107
M-4-6	Existing Airports in Area 4—Kern -----				113
	Existing Airports in Area 6—Fresno Metropolitan -----				113
M-5	Existing Airports in Area 5—Mid Coastal -----				111
M-7	Existing Airports in Area 7—Inyo-Mono -----				115
M-8-10	Existing Airports in Area 8—Stockton Metropolitan -----				121
	Existing Airports in Area 10—Sacramento Metropolitan -----				121
M-9	Existing Airports in Area 9—San Francisco Bay Area-----				119
M-11	Existing Airports in Area 11—Redwood Empire -----				123
M-13	Existing Airports in Area 13—Modoc Plateau -----				125
M-12-14	Existing Airports in Area 12—Chico-Red Bluff Area-----				127
	Existing Airports in Area 14—Shasta-Cascade -----				127
N	Population Per Civil Airport by Counties—December, 1946-----				141
O	Scheduled Airline Service Pattern—December, 1946 -----				148
P	Per Capita Aircraft Registration by Counties—October 15, 1946-----				158
	PART V AERONAUTICAL PROJECTIONS				
R	Classification of Airports-----				174

Index of Tables

Table No.	Title of Table	Page No.	Table No.	Title of Table	Page No.
PART I INTRODUCTION			19	Volume of Highway Traffic Into California at Points of Entry—From October, 1945, through September, 1946--	54
SECTION 2—AERONAUTICAL PROGRESS					
1	Progress of Civil Aviation in the United States—Twenty Years—1926-1946 --	2	20	Volume of Highway Traffic Into California—October, 1945-November, 1946--	55
SECTION 3—AIRPORTS					
2	Civil Airports—1932 -----	7	PART III ECONOMIC FACTORS		
3	Civil Airports—1938 -----	7	SECTION 1—NATURAL RESOURCES		
4	Civil Airport Development 1933-1938----	8	21	California Mineral Production—1944 and 1945 -----	57
5	Defense Landing Area Projects in California -----	9	22	Mineral Production in California—By Aviation Areas -----	58
6	United States Airports by Classes-----	10	23	Potential and Actual Lumber Production in California By Aviation Areas and Counties, 1945 -----	59
7	Estimated Capital Expenditures for Civil Airports—By Source of Funds—Through 1944 -----	10	SECTION 2—AGRICULTURE		
8	Federal Expenditures for Civil Airports—Cumulative Through 1944-----	11	24	Principal Crops and Livestock Products of California By Counties in Order of Annual Value—1940 -----	64
9	Development of Airports by Types and Classes—1929-1946 -----	12	SECTION 3—INDUSTRY		
10	Total Federal Expenditures in Transportation Fields -----	13	25	Area and Population Study—Western Economic Region (Pacific and Mountain States) -----	66
11	Airport Attrition in California—A 1946 Roll Call of 161 Airports in California—October 20, 1929-----	17	26	Population Increases—Western Economic Region (Pacific and Mountain States) -----	66
12	Summary of 1947 Federal Airport Program -----	22	27	California Manufacturing Industries—Average Number of Factory Workers -----	67
SECTION 6—TYPES OF AIRPORTS			28	California Manufacturing Industries—Total Annual Wages of Factory Workers (in thousands of dollars)---	67
13	Aircraft Operations at 10 Leading Airports—January-June, 1946 -----	27	29	California Basic Industries—Value of Production Compared with United States Totals (in thousands of dollars) -----	68
PART II PHYSICAL CHARACTERISTICS OF CALIFORNIA			SECTION 4—COMMERCE		
SECTION 3—CLIMATE			30	Summary of Water-Borne Commerce in the Pacific Coast States, 1940-----	70
14	Climatic Data—California -----	39	SECTION 5—HUMAN FACTORS		
SECTION 4—LAND USE			31	California's Rank in Population—Based on United States Census—1850-1945	73
15	Land Usage in California by Aviation Areas and Counties—1940-----	44	32	California Population in Groups of Places—Classified as to Size, Urban and Rural -----	74
SECTION 5—RECREATIONAL AREAS			33	Population Density Increase-----	74
16	Volume of Visitors to National Parks and Monuments—By California Aviation Areas—1941 and 1946-----	46	34	California Population by Counties—With Projections to 1955-----	76
17	Volume of Visitors to National Parks and Monuments—in California—1946 ---	48			
18	Visitors to California State Parks 1946—By Aviation Areas and Counties----	49			

Index of Tables—Continued

<i>Table No.</i>	<i>Title of Table</i>	<i>Page No.</i>	<i>Table No.</i>	<i>Title of Table</i>	<i>Page No.</i>
35	Rate of Population Growth—California and Its Counties—1900-1955-----	77	50	California Civil Airports of Public Ownership by Proprietary Division of Government—for Areas and Counties—April, 1947 -----	131
36	Population Density—California Aviation Areas and Counties—July 1, 1946---	78	51	California Civil Airports of Public Ownership—By Classes—For Areas and Counties—April, 1947 -----	133
37	California County Rural-Farm, Rural Non-Farm, and Urban Dwellings, 1940 -----	80	52	California Civil Airports—Commercial Only—By Classes—For Areas and Counties—April, 1947 -----	136
	SECTION 6—INDICES OF PURCHASING POWER		53	California Civil Airports—Density Per Square Mile and Density Index by Aviation Areas and Counties—April, 1947 -----	138
38	Total and Per Capita Individual Incomes for California by Aviation Areas and Counties—1940 and 1945-----	83	54	California Civil Airports Per Capita by Areas and Counties With Airport Per Capita Index—April, 1947-----	140
39	Per Capita Retail Sales for California—Gross and Taxable—By Aviation Areas and Counties—1939-1940-1945	86	55	California Civil Airports—Weighted Inventory, With Ratio to Population and Rank of Counties-----	142
40	Gross Cash Farm Income for California by Aviation Areas and Counties—1940 and 1945-----	88		SECTION 3—SCHEDULED AIR TRANSPORT	
41	Assessed Valuation and Per Capita Value for California Aviation Areas and Counties—1940-1945 -----	90	56	Daily Flights In and Out of California Cities—By Aviation Areas-----	149
42	Automobile and Truck Registrations for California by Aviation Areas-----	92	57	Growth of Scheduled Air Transport in California—1939-1946 -----	151
43	Bank Deposits of Individuals, Partnerships and Corporations for California by Aviation Areas -----	93	58	Airline Passenger Traffic Generated—Rank of California Terminals in Nation—September, 1940 -----	152
44	Gross Postal Receipts at First Class Post Offices—and Per Capita by California Aviation Areas and Counties—Calendar Year 1945 -----	94		SECTION 4—NON-SCHEDULED AVIATION	
45	Development of Buying Potential or Economic Index for Aviation Areas and Counties—1945 -----	95	59	California Aircraft Registration by Counties and Cities from Addresses of All Owners of Record—May 1, 1946-----	154
	PART IV AERONAUTICAL APPRAISAL		60	California Aircraft Registration by Areas and Counties Estimated Per Capita Ownership—October 15, 1946 -----	157
	SECTION 2—AIRPORTS		61	California Aircraft Registration by Areas and Counties Per Capita Ownership and Ownership Index—May 1, 1946-	159
46	California's Total Airport Inventory—Summary of Area Lists by Categories and Classes—April, 1947-----	128	62	California Population and Aircraft Registration—Ratio of Rural to Urban Per Capita Ownership by Aviation Areas—May, 1946 -----	161
47	Development of California Airports—By Categories, 1929-1947 -----	128		PART V AERONAUTICAL PROJECTIONS	
48	Development of California Airports—By Classes, 1938-1947 -----	129		SECTION 1—TRENDS IN AVIATION DEVELOPMENT	
49	California's Total Airports by Categories—Recapitulation by Areas and Counties—April, 1947 -----	129	63	Population Projections—California Aviation Areas and Counties—1946 to 1950 and 1955 -----	178

Index of Tables—Continued

Table No.	Title of Table	Page No.	Table No.	Title of Table	Page No.
	SECTION 2—SCHEDULED AVIATION PROJECTION		81	Estimated Potential Air Traffic in Fresh Vegetables to Metropolitan Areas in the United States at Ton-Mile Rates Indicated	199
64	Growth of Scheduled Air Transport (United States Domestic) Annual Data	181	82	Air Freight Potential of Agricultural Perishables by California Aviation Areas and Counties—1950 and 1955 ..	200
65	Comparison of Domestic Airline Passen- ger Miles with Pullman Car Pas- senger Miles	182	83	Air Freight Potential—Women's Apparel Industry in New York	202
66	Air and Rail Leaders in Passenger Rev- enue	182		SECTION 5—POSSIBLE FOREIGN DEVELOPMENT	
67	Growth of Scheduled Air Transport— Domestic Revenue Passengers On and Off for United States and California Stations—By Numbers and Percent. ..	183	84	Air Lines Serving Foreign Trade Through California Ports	206
68	Projected Air Transport for California— Domestic Revenue Passengers On and Off—1950 and 1955	184	85	United States Exports of Domestic and Foreign Merchandise by Air by Selected Countries of Destination— 1945	207
	SECTION 3—NON-SCHEDULED AVIATION PROJECTION		86	United States Exports of Domestic and Foreign Merchandise and General Imports by Air, by California Cus- toms Districts, January-December, 1946	208
69	Growth of Non-Scheduled Flying in the United States (Annual Data)	186	87	Comparison of Water and Air-Borne Ex- ports of Domestic and Foreign Mer- chandise and General Imports at California Ports, 1946	209
70	Increase in Civil Aircraft—1927 through 1946	187		PART VI CONCLUSIONS	
71	Increase in Civil Pilots—1929 through 1946	188		SECTION 1—ANALYSIS OF AREA RECOMMENDATIONS	
72	Increase in Student Certificates Issued Per Year 1927-1946—United States	188	88	Projected Airport Improvement and De- velopment by Aviation Areas and Counties, 1950 and 1955	214
73	California Aircraft Ownership Projection —By Areas and Counties—1950 and 1955	190		SECTION 2—AIRPORT NEEDS OF CALI- FORNIA CITIES	
74	Miles Flown in Non-Scheduled Flying— By Types—1931-1942	192	89	Present and Projected Civil Airport Facilities of California Urban Places —Classified by Size	224
	SECTION 4—AIR CARGO PROJECTION			SECTION 3—AIRPORT NEEDS OF RURAL AREAS	
75	Air Express Analysis, April 1941—Rail- way Express Agency Shipments	194	90	Proposed Non-Urban Airport Develop- ment for Recreational and Forest Service Usage—By Aviation Areas and Counties—1950 and 1955	233
76	Number of Establishments in California Manufacturing Selected High Value Commodities—1939	196		SECTION 4—EFFECT OF PROPOSED DEVELOPMENT	
77	Tonnage of Revenue Freight in Selected Commodities—California—1944	197	91	Present and Projected Civil Airport Faci- lities and Capacities—By Aviation Areas and Counties, 1947-1950-1955 ..	236
78	Carlots of Selected Fresh Fruits and Vege- tables Originating in California 1939 ..	198			
79	1930-1939 Average Rail Shipments— Fresh Vegetables and Fruit	198			
80	Estimated Potential Air Traffic in Fresh Fruits to Metropolitan Areas in the United States at Ton-Mile Rates Indi- cated	199			

Index of Tables—Continued

<i>Table No.</i>	<i>Title of Table</i>	<i>Page No.</i>	<i>Table No.</i>	<i>Title of Table</i>	<i>Page No.</i>
APPENDICES					
APPENDIX 1—SAN DIEGO COUNTY			APPENDIX 8—STOCKTON METROPOLITAN		
92	Indices of Purchasing Power for Area 1__	243	113	Indices of Purchasing Power for Area 8__	345
93	Population of Area 1 by Five-Year Periods—1930-1955 _____	244	114	Population of Area 8 by Five-Year Periods—1930-1955 _____	347
94	Population Statistics of Area 1_____	245	115	Population Statistics of Area 8_____	347
APPENDIX 2—LOS ANGELES METROPOLITAN			APPENDIX 9—SAN FRANCISCO BAY		
95	Indices of Purchasing Power for Area 2__	258	116	Indices of Purchasing Power for Area 9__	360
96	Population of Area 2 by Five-Year Periods—1930-1955 _____	260	117	Population of Area 9 by Five-Year Periods—1930-1955 _____	363
97	Population Statistics of Area 2_____	260	118	Population Statistics of Area 9_____	364
APPENDIX 3—DESERT REGION			APPENDIX 10—SACRAMENTO METRO- POLITAN		
98	Indices of Purchasing Power for Area 3__	281	119	Indices of Purchasing Power for Area 10_	385
99	Population of Area 3 by Five-Year Periods—1930-1955 _____	283	120	Population of Area 10 by Five-Year Periods—1930-1955 _____	388
100	Population Statistics of Area 3_____	284	121	Population Statistics of Area 10_____	389
APPENDIX 4—KERN COUNTY			APPENDIX 11—REDWOOD EMPIRE		
101	Indices of Purchasing Power for Area 4__	291	122	Indices of Purchasing Power for Area 11_	402
102	Population of Area 4 by Five-Year Periods—1930-1955 _____	292	123	Population of Area 11 by Five-Year Periods—1930-1955 _____	404
103	Population Statistics of Area 4_____	293	124	Population Statistics of Area 11_____	404
APPENDIX 5—MID COASTAL COUNTIES			APPENDIX 12—CHICO-RED BLUFF		
104	Indices of Purchasing Power for Area 5__	303	125	Indices of Purchasing Power for Area 12_	415
105	Population of Area 5 by Five-Year Periods—1930-1955 _____	305	126	Population of Area 12 by Five-Year Periods—1930-1955 _____	418
106	Population Statistics of Area 5_____	306	127	Population Statistics of Area 12_____	418
APPENDIX 6—FRESNO METROPOLITAN			APPENDIX 13—MODOC PLATEAU REGION		
107	Indices of Purchasing Power for Area 6__	321	128	Indices of Purchasing Power for Area 13_	426
108	Population of Area 6 by Five-Year Periods—1930-1955 _____	323	129	Population of Area 13 by Five-Year Periods—1930-1955 _____	428
109	Population Statistics of Area 6_____	323	130	Population Statistics of Area 13_____	429
APPENDIX 7—INYO-MONO COUNTIES			APPENDIX 14—SHASTA CASCADE REGION		
110	Indices of Purchasing Power for Area 7__	335	131	Indices of Purchasing Power for Area 14_	438
111	Population of Area 7 by Five-Year Periods—1930-1955 _____	337	132	Population of Area 14 by Five-Year Periods—1930-1955 _____	440
112	Population Statistics of Area 7_____	337	133	Population Statistics of Area 14_____	441

Index of Figures

<i>Figure</i>	<i>Page</i>	<i>Figure</i>	<i>Page</i>
PART I INTRODUCTION			
1	3	6	150
			152
PART III ECONOMIC FACTORS			
2	72	7	152
3	85		
4	85	PART V AERONAUTICAL PROJECTIONS	
PART IV AERONAUTICAL APPRAISAL			
5	135	8	191
		9	192

SUMMARY

This study is the result of almost one year of preparation and intensive research. The preparation consisted of a state-wide campaign advocating local and regional planning by political sub-divisions to provide for community aeronautical needs, present and projected. The research included gathering together more factual information concerning aviation in California than had been attempted previously by any agency. The challenge to plan has been accepted by one-half of the counties of the State, and by many of its cities. The results of the research are included in this report.

California has always accepted aviation to a greater extent than most of its sister states and has always been known as the "Ten Percent State" in national aviation statistics, having consistently contributed at least ten percent to the Nation's total in aircraft ownership, certificated pilots and airline traffic, notwithstanding its population ratio of from five to six percent during the past two decades.

California has been favored with physical and material advantages which have given its people the desire and ability to possess the best that life offers—hence, the willingness to accept the benefits of aviation.

The war-time expansion of air power greatly augmented California's already important aircraft industry, enabling it to produce half of the nation's aerial might. This vast expansion of industry brought additional population and wealth and an increased interest in aeronautics. Military training installations were more numerous in California than in any other state except Texas. Tens of thousands of pilots were trained in California skies. Those training fields are now becoming a major asset to civil aviation. Those pilots are returning to California's sky in rapidly mounting numbers. Their younger brothers and sisters are alert to aviation's potentialities. Personal use of aircraft and patronage of scheduled air transport has already tripled since the war's end. Cargo by air, proved practicable by the exigencies of war, now holds promise of phenomenal development. Adequate aviation facilities are the prime prerequisite to continued development.

The analogy between the development of the automobile era and the air age has been used frequently throughout this report. The parallel is striking in every detail. Good roads, followed by volume production and the consequent lowering of cost popularized the automobile. But the good roads movement provided the impetus. Good airports will have similar profound effect on air travel. The good airports movement is only beginning.

Each new airport increases the utility of air transportation by increasing the usefulness of every other airport and every airplane, just as each mile of highway complements every other mile and increases the utility of every motor vehicle. More air travelers can utilize air transportation all of the way to their destination when all points are accessible by air. The personal airplane can fulfill its mission of providing dependable transportation only if it can be utilized to reach any reasonable objective with minimum delay.

The utility of any form of transportation is determined, in part, by its ability to deliver the traveler as close as possible to his ultimate destination without change to another form of transportation. In aviation, this dictates that airports be constructed close to origin and destination centers—an ideal infrequently realized. This report stresses the immediate need for airport planning and site acquisition to preserve and protect suitable close-in locations where costs might prove prohibitive if all action is delayed until actual construction is mandated by an emergency condition. Failure to plan far enough ahead, acquire and protect the necessary land for future development, can prove as expensive to aviation ultimately as it is proving now with respect to our highway and freeway programs.

This report indicates that California now has 47 active or standby military airports, 202 publicly owned or sponsored civil airports, 207 commercial airports—privately owned—and upward of 100 private airports for personal use of the owner and his friends or guests. Of these, 409 are considered as available civil airports which presently accommodate 8,500 civil aircraft. The ratio of aircraft to airports is unduly high in only two places—the major metropolitan centers of Los Angeles and the San Francisco peninsula. Projections indicate a 300 percent increase in aircraft registration by 1950 which will tax existing facilities in most metropolitan areas of the State. An additional increase of 267 percent is predicted between 1950 and 1955, which would render our present airport facilities totally inadequate. The present needs are coverage and quality; the future needs are quantity and quality.

The pattern of main line air transport service reaches all of California's principal centers of population. Expansion will be in the direction of additional schedules, as required, and additional operating companies in a few instances as dictated by healthy competition. In general, the airports at main line stops are either adequate or are presently being improved to adequate standards. For the purposes of this report, Class 4 airports are considered the minimum standard

for regular air carrier operation. Dual runway systems are considered essential when aircraft operations approach or exceed 1 per minute. Only three main line air carrier stops in California have airports of less than Class 4 specifications insofar as runways are concerned.

Feederline air transport is destined to connect many of the smaller communities of the State with each other and with the major centers of population. It will fill a definite need, hasten the development of remote areas and expedite business and social relations throughout the vast domain. Such service is scarcely six months old in California but its acceptance has exceeded the most optimistic prediction and already has indicated a justification for similar service where doubt formerly existed as to its feasibility. Feederline routes now serve 23 communities in California twice daily. Projected feederlines will serve an additional 38 communities, 28 of which now have no air transport service and will thus be connected with mainline stations. Since the aircraft readily available at the present time for feederline service are of the older type originally designed for mainline service and because traffic to date appears to warrant the continued use of relatively large equipment it has been the policy throughout this report to consider Class 3 airports the minimum standard necessary for regular feederline operation. Upon this basis all but three of the presently-certificated feederline stations have airports of minimum adequacy. Of the 28 communities not now served by air transport, and included in pending feederline route applications, five lack suitable airport facilities and eight have marginal Class 2 airports. All others have suitable facilities ready for the proposed service. The proposed additional stops would complete the air transport pattern of California.

Non-scheduled aviation—all activities other than certificated air carriers—represents an equally important phase of aeronautical activity which has flourished in California because of the air-mindedness of its citizens, the diversity of uses for aircraft and the generally favorable flying weather enjoyed throughout the State. Per capita registration of aircraft in this category is 51 percent above the national average. Private flying, or the utilization of the privately-owned aircraft in personal business and pleasure, constitutes the largest segment of nonscheduled aviation and offers the greatest opportunity for expansion under suitable impetus. It is here that the need for expansion of aviation facilities is most pointed since the sale and use of personal aircraft is definitely suffering in metropolitan centers, at least, by the dearth of operating bases. Major emphasis in this study has, therefore, been placed upon the development of facilities to serve the private flyer. For the immediate future, numerous small airports with comparatively modest facilities have been advocated rather than a smaller number of more elaborate airports.

Air cargo is developing rapidly into a service of major utility. Its portent to western agriculture and industry is being recognized by the more alert leaders in both fields. California produces many items of food and merchandise which are adaptable to air cargo shipment, either because of their scarcity in other parts of the Nation or because of their perishable nature. The potentialities of air cargo are quite thoroughly discussed in the body of the report and recommendations for special airports suitable to cargo operations are included wherever justification seems probable.

International Air Transport holds great promise for the future of aeronautics in California. New horizons beckon and opportunities for the general expansion of California's economy through the adaptation of air transport to international business relations appear unlimited.

One of California's largest sources of income is its tourist traffic. An attractive system of airports created conveniently near its scenic attractions should draw increasing numbers of tourists by virtue of the convenience and time-saving advantages of air travel. The greatest specific need for airports, at the present time, is in those areas where tourist attractions and recreational opportunities abound, none of which are accessible at present by direct air travel. Consideration has been given to the provision of air access to the National Parks and Monuments, the State Park System and the many public recreational areas which blanket the region. These same facilities serve the three-fold function of recreation, forest protection and emergency airports.

Throughout the report it has been urged that existing airports be brought up to the minimum standards of the class which they purport to represent. This policy is in recognition of the fact that year-round usefulness demands certain standards of drainage, paving, lighting, terrain clearance and service facilities. It is an attempt to escape from the former conception of an airport as any fairly level field from which an airplane might be operated with reasonable safety by a skilled pilot. It recognizes that a discerning and safety-conscious flying public no longer is satisfied with bare minimums of safety or service any more than the motoring public is satisfied with sub-standard highways or the old roadside garage. Airports can and must be made attractive and inviting both to local users and prospective visitors if flying is to become universally popular.

In certain localities higher class facilities than can be justified by local demand or than can be provided entirely by local agencies have been recommended as essential to the completion of a pattern of adequate aeronautical facilities for the State. Such localities should receive special consideration in the allocation of any funds made available through federal or state-aid programs. This applies particularly to recreational areas. Only by means of a state-coordinated effort can

an adequate, uniformly dependable system of aviation facilities be achieved. This statement does not infer state interference with the local government's prerogatives. It means simply, that the state must do over-all planning and take up where local governments are either unwilling or unable to provide essential facilities. Using the analogy again — local governments never could have built the many miles of good highways in sparsely settled areas without state (and federal) aid, which is simply a means of spreading costs over a broader base.

The facts presented in this report furnish strong underlying, though unexpressed, arguments in favor of a state agency responsible by law for the coordination of community efforts with respect to aviation and the development of an adequate system of airports within the State. After considering such legislation at each session for the past twenty years, the California Legislature, at its 1947 session, created the California Aeronautics Commission which will become effective in September, 1947, and which is empowered to implement the purposes enumerated, thus assuring that California will benefit proportionately from the Federal Airport Program.

The need for establishing fundamental principles of law with respect to aviation is recognized, as is the urgency for defining the legal status of airports—public or privately owned—with respect to eminent domain and the rights of condemnation.

The protection and preservation of existing airports against encroachment and the erection of hazards inimical to flying safety is recognized as a problem of planning, zoning and acquisition of air easements. Clarification and strengthening of law in this respect would prove beneficial to permanent aeronautical development.

Finally, this report represents a foundation upon which to build for the future. It suggests possible avenues of approach to a problem worthy of the best planning minds of the State. It should be amplified and implemented. The second phase of detailed planning and project development must be undertaken without delay if costly mistakes and expensive readjustments at a later date are to be minimized. The public of California is air-minded to a greater degree than any other group in the world. Let this fact serve as a challenge to public officials in every level of government.

CALIFORNIA AIRPORTS 1947



A STUDY OF THE
AERONAUTICAL STATUS OF CALIFORNIA
WITH PROJECTIONS FOR THE FUTURE AND
RECOMMENDATIONS FOR ADEQUATE DEVELOPMENT

STATUTE MILES
20 10 0 20 40 60 80 100

PLATE A

PART I — INTRODUCTION

1. THE AIR AGE

“The future of civil aeronautics in the United States is limitless. In a territory of vast distances without international boundaries, whose people are engaged in commercial enterprises where speed of intercommunication is a primary consideration, and with a huge volume of goods to be transported, the airplane affords a new transportation vehicle that fits exactly into the scheme of the ever-expanding industrial and social life of America.

“With the support of a people awakened to the benefits of air travel, the United States will forge ahead in its air commerce. Huge airliners will fly from one end of the continent to the other, day and night, with safety and assurance.”

These prophetic words appeared in the Domestic Air News of the newly organized Aeronautics Branch of the United States Department of Commerce in August, 1928, at a time when men were beginning to dream of and plan for a Nation-wide system of air transport, when air mail had scarcely passed the experimental stage and when only a few hardy pioneers had utilized commercial air transportation. Not until 1931 was the first transcontinental airline launched.

Yet in the brief span of 18 years, the American people have “awakened to the benefits of air travel,” and huge airliners fly many times daily from one end of the continent to the other and beyond to the far corners of the earth. Notwithstanding personal prejudices against this entirely new form of transportation, recent surveys show that 20 percent of the populace has accepted its benefits and each succeeding year adds new converts.

World War I suggested the role of the airplane in modern warfare, but it remained for World War II to prove the airplane's all round utility, not only as a weapon carrier but as an efficient, dependable, swift and highly satisfactory means of communication and transport. The world has witnessed the marvels of air transportation wrought under wars' impetus and is eager to adapt them to peaceful commercial pursuits. The airplane is a proven instrument for both good and evil. It is the key to adequate defense and to commercial domination.

Aviation stands ready to make its contribution to the national economy, not only as a potentially important manufacturing industry but through far-reaching effects on the whole operation of our commerce at home and abroad.

Domestic air transport five times as fast as surface media at comparable rates is now available.

Air cargo carriers offer four to five times surface speeds at less than twice present surface express rates.

This vast increase in the speed of transportation at a low enough cost to render it available to a large segment of our people is increasing greatly the efficiency of our industrial processes. The tempo of commerce and industry is being accelerated. Our foreign trade is benefiting particularly. The world is shrinking to a size comparable to the United States of the pre-aviation era.

Truly the Air Age is upon us and only the failure of mankind to grasp its real significance and to *plan* and *act* to avail himself of its benefits can delay its full fruition.

2. AERONAUTICAL PROGRESS

The civil aviation industry, embodiment of the nebulous Air Age, has progressed, in the span of one generation, from mankind's age-old dream of flying, to the reality of the modern business world. It now represents an \$800,000,000 annual business in the United States, employing 200,000 people, with every prospect of becoming a \$3,000,000,000 industry, which will employ 900,000 people, or 2% of the Nation's labor force, by 1955. The national economy and tax structure has benefited immensely from this infant industry. The implications of 700,000 new jobs and this expanding new source of wealth can scarcely be measured.

Less tangible gains of tremendous importance include the salutary effect of a comprehensive system of air transportation upon general business activity, domestic and foreign; the contribution of the airplane to international relationships; and the value of a thriving aviation industry to the national defense.

The civil aviation industry consists of five major components—ground facilities and services, scheduled air transportation of persons, mail and property, non-scheduled commercial flying, individual or private flying and aircraft production.

Ground facilities—airports and airways—are to the airplane what harbors and highways are to surface transportation. As is pointed out in the following section, the usefulness of the airplane may be measured, to a considerable degree, by the availability of adequate landing areas and air navigation aids which make possible the safe and orderly flow of air traffic in good weather and bad. The ground facilities for civil aviation in the United States lag considerably behind the operations which they serve. As shown in Table 1, the number of established airports has scarcely doubled in the past fifteen years, while the number of aircraft

has increased eight times, scheduled air carrier flying has increased eight-fold, and non-scheduled flying is at least five times the 1931 figure. The situation has now reached the point where air traffic is seriously congested at many airports and along many sections of the airways, particularly under unfavorable weather conditions.

The inadequacy of our present airport system is apparent in a cursory glance. Forty-seven percent of the counties of the United States have no airports and

less than half of the communities of 1,000 or more population have airport facilities. Big-city airports are already over-crowded. Airports at half of the 300 or more places now designated as Air-Carrier stops are deficient in length of runways, clearances of approaches or other features important to efficiency and safety of operations.

With this situation true nationally, it is even more acute in California, where population has increased 97% in 20 years, against a national increase of 20%

TABLE 1
PROGRESS OF CIVIL AVIATION IN THE UNITED STATES
Twenty Years—1926-1946

	1926	1931	1936	1941	1946	Ratio Latest- Earliest
GENERAL						
Established Airports.....	*700	2,093	2,342	2,484	4,350	6.2
Aircraft in Service.....	*2,500	10,680	9,229	24,836	85,000	34.0
Certificated Pilots.....	None	17,739	15,952	129,947	400,061	22.6
Civil Airways-Miles.....	2,041	17,152	22,245	32,679	39,400	19.3
Radio Range Stations.....	None	None	146	312	450	3.0
SCHEDULED AIR CARRIERS (Domestic Only)						
Authorized Route Miles.....	8,252	30,451	28,874	41,915	65,400	7.9
Miles Flown Annually.....	4,258,771	42,755,417	63,777,226	133,022,679	305,962,344	71.8
Miles Flown Daily.....	11,668	117,138	174,255	364,446	838,253	71.8
Revenue Passengers, Year.....	5,782	413,366	911,148	3,768,892	12,036,240	2,323.
Mail Ton-Miles, Year.....	NA	3,140,205	5,741,436	12,900,495	*32,000,000	10.9
Express-Freight Ton-Miles.....	995	220,657	1,860,809	5,242,529	*37,000,000	3,700.
Average Speed—M.P.H.....	90	100	149	159	200	2.2
Coast to Coast Schedule—Hrs.....	48	36	24	13	9.45	0.22
Coast to Coast Fare.....	\$300	\$200	\$128	\$125	\$118	0.39
Passenger-Miles per Passenger, Fatality..	NA	4,258,000	9,903,000	42,621,000	82,881,000	19.5
NON-SCHEDULED AVIATION						
Miles Flown Annually.....	18,746,600	94,343,100	93,320,400	346,303,400	NA	18.5
Passengers Carried.....	771,010	1,867,517	1,466,058	*1,700,000	NA	2.2
Miles Flown per Fatal Accident.....	315,789	372,898	586,921	1,595,868	NA	5.0
AIRCRAFT PRODUCTION						
Domestic Civil.....	658	1,807	1,637	6,844	*30,000	45.6
Export.....	50	140	527	5,997	NA	114.
U.S. Military.....	478	853	858	13,293	1,200	2.5
Total.....	1,186	2,800	3,022	26,134	*31,200	26.3
Value Aircraft Products.....	\$17,700,000	\$48,500,000	\$78,100,000	\$1,765,000,000	\$450,000,000	25.4

PROGRESS OF CIVIL AVIATION IN CALIFORNIA

	1926	1931	1936	1941	1946	Ratio Latest- Earliest
GENERAL						
Established Airports.....	*50	165	192	174	325	6.5
Aircraft in Service.....	190	1,186	956	2,404	8,500	44.7
Certificated Pilots.....	None	3,327	3,028	*12,000	47,200	14.1

* Estimated. NA—Not available.

Sources : CAA Statistical Handbook and CAA Bulletins.

and where the ratio of airports to the national figure has declined from .107 in 1929 to .076 at the present time, as illustrated in Table 9. Reduced to a per capita basis, California's disadvantageous position becomes more apparent.

<i>Airports per 100,000 population</i>				
	1929	Ratio	1946	Ratio
California	2.92		3.52	
United States	1.24	2.36	3.07	1.15
				Percent increase
				20.5
				147.6

In 17 years California has increased its airports per capita only 20.5% compared with a national increase of 147.6%, and reduced its per capita standing with respect to the national figure by 50%. On an area basis California's airports have doubled while the nation's have tripled in number. California, the second-largest state in area, third in population and first in aeronautical activity can ill afford to neglect its airport facilities.

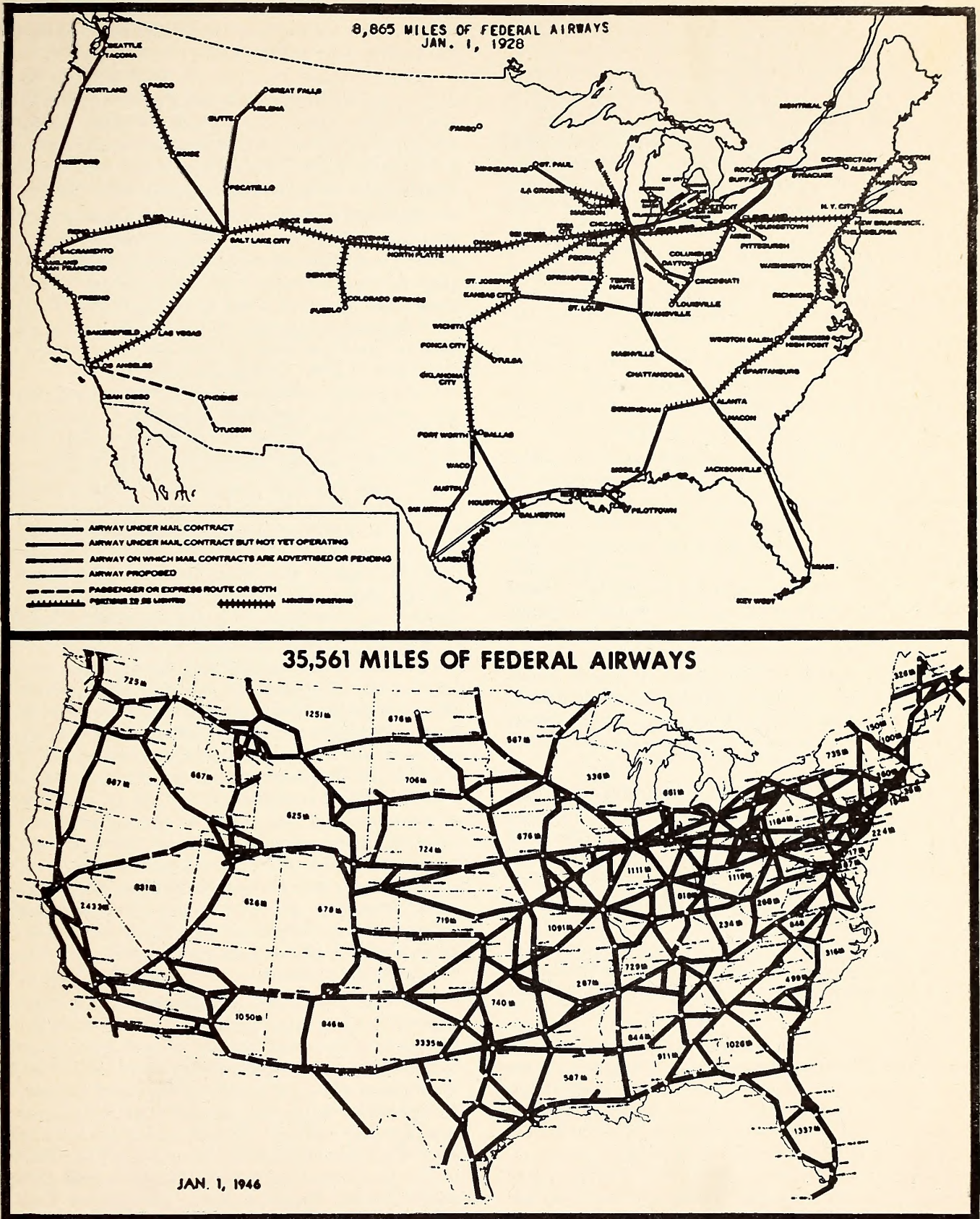


FIGURE 1. GROWTH OF THE FEDERAL AIRWAYS SYSTEM

The mileage of Federal Airways—that highway system of the air, connecting all principal cities of the country—has increased from 2,041 in 1926, to 8,865 in 1928, 35,561 in 1944 (Figure 1) and 39,400 in 1946, a nineteen-fold increase in 20 years. Since 1942, reported traffic on the Federal Airways has tripled and, on the more important routes, has reached proportions which render the present type of facilities entirely inadequate, and suitable improvement programs are now underway to accommodate the projected increases in air traffic. This program of the Federal Government includes the replacement of present radio ranges with very high frequency facilities which provide static-free communication and guidance to pilots; installation of instrument landing systems at all major terminals to facilitate safe landings under conditions of restricted visibility; modernization of air traffic control centers with automatic equipment to eliminate traffic delays on busy routes; and intensified development of radar and other electronic devices for application to civil aviation.

The Scheduled Air Carrier phase of civil aviation shows remarkable vigor and growth throughout its 20-year life, but particularly during the past seven years. While still a very small transportation system, airlines have already taken their place among the major railroads of the country in gross revenue (Table 66). Continued expansion is inevitable and will be accelerated by the introduction of larger, faster, more economical aircraft as suitable airway and terminal facilities become available. The striking growth of this phase of civil aviation has been achieved under relatively unfavorable conditions of inadequate equipment and facilities. With modern aircraft, airways and airports, there is good reason to anticipate greater expansion in the future.

In 20 years authorized route-miles have increased eight-fold, miles flown daily have increased 72 times, passengers carried annually are 2,300 times the 1926 figure, mail ton-miles are many times as great. In the same interval average speeds have more than doubled, time schedules have been reduced 80 percent and the cost to the user reduced 60 percent. Air transport is at least 20 times safer and more dependable at present than in 1926, as evidenced by the record of 82,881,000 passenger miles flown per passenger fatality by domestic airlines in 1946.

Air transportation of commodities is an undeveloped phase of the industry now coming into prominence by the availability of surplus military transport aircraft and the recent announcements by aircraft manufacturers of cargo aircraft designed to carry 20 ton cargos, 2500 miles at over 200 miles per hour, at operating costs as low as 3.9 cents per ton-mile, offering speedy service at a cost competitive with the faster surface transportation media. This subject is treated at length in a subsequent section.

Truly “we are at the opening verse of the opening chapter of a book of endless possibilities” as regards the future of air transportation.

Non-scheduled Aviation, the huge segment of the civil aviation industry comprising private flying, industrial flying, charter operations, contract transport, aerial photography and flight instruction, is responsible for the bulk of peacetime aviation activity and provides the potential for the largest expansion of the future.

Although seriously curtailed by wartime priorities, this phase of the industry has experienced a 20-year growth hardly less spectacular than scheduled air transport. Aircraft in such service have multiplied 34 times since 1926, and miles flown annually at least 25 times. Annual operations in this field exceed that of the scheduled air lines. Licensing of pilots and other airmen was instituted in 1926. Certificated pilots now exceed 400,000 and there is a vast potential of army-trained personnel available for immediate expansion of the personal airplane market. Conservative estimates anticipate a five-fold increase in this phase of activity by 1955.

A break-down of non-scheduled flying in 1939 (Figure 8) shows that 29.1 percent was conducted for pleasure, 14.3 percent in connection with a business, 19.3 percent in industry and commerce, and 37.3 percent in flight instruction. This latter figure is higher than normal due to the pilot training program then being conducted in connection with the expanding national defense.

Expansion of non-scheduled flying in the eighteen months since V-J day has exceeded all expectations. Over 600 new non-scheduled operators are offering air transportation to the masses. During 1946 over 30,000 personal type aircraft were produced and sold. A backlog of 25,000 firm orders was carried over into 1947. *The only immediate limitation which can be placed upon the expansion of this phase of the industry is that imposed by lack of suitable ground facilities properly located to render the personal aircraft fully advantageous to the private owner.* With an adequate and complete system of airports the Civil Aeronautics Administration estimate of 400,000 non-scheduled aircraft by 1955 is within easy reach. Again, airports are the key to the situation.

Aircraft production, greatly expanded during the war, offers the greatest permanent contribution in dollars and employment within the aviation industry. Non-scheduled and private flying afford the one means of retaining a portion of the war-expanded industry as an important industrial asset and as the nucleus of expansion for national defense, should the need again arise. This possibility is of vital concern to California, where the aircraft industry still is the largest durable goods industry despite post-war curtailment. California's aircraft factories represent a billion-dollar investment, and are the potential peacetime employers of

upward of 100,000 skilled laborers. They contribute at least \$10,000,000 annually to state and local taxes and altogether represent an economic resource worthy of the utmost consideration.

Civil aircraft production increased from a nominal 658 airplanes in the year 1929 to 6,844 in the last pre-war year 1941. In the latter year a goal of 50,000 aircraft per year was first discussed by advocates of a strong air defense program. Actually our aircraft industry produced 100,000 aircraft in one year at the height of war activity. With the cessation of hostilities, military production was promptly and sharply curtailed. Notwithstanding, the year 1946 saw more than 30,000 civil aircraft produced and sold in the United States—almost five times the best pre-war year.

The Need

Land, sea and air are man's only media of transportation. For thousands of years transportation by land and sea has undergone continuous improvement. Highways and harbors, motor cars and ocean liners have replaced the primitive trail, oxcart and canoe. Speed, comfort and utility have increased an hundred fold.

During all of these centuries the ocean of the air challenged man's ingenuity. Here was the one free medium of transportation, offering a direct line of travel to any spot on earth—knowing no barriers of mountain, desert or ocean. The dawn of the air age was inevitable. Its advent has revolutionized, in less than half a century, all former conceptions of travel. Any place on earth is now within 60 hours travel time.

To be useful, aircraft, like ocean vessels must have adequate, safe, convenient terminal facilities. The airport is the basic facility of aviation, just as the highway is the basic facility of automotive transportation, or harbor facilities are basic to water transportation. Without airports, there can be no flying, no aircraft industry, no development of the aircraft arts and sciences and no utilization of this last new form of speedy, world-wide communication. The better the airport provision, the greater the opportunity for the maximum utilization of aircraft in serving the general welfare.

It is not merely true that there can be no flying without airports; it is equally true that no airport exists by itself. The usefulness of every airport depends upon the status of all other airports within the range of modern aircraft. Each depends upon the other's existence, and is deeply influenced by the quality of its neighbors. A single isolated airport, with based aircraft limited to purely local activities, is comparable to a city without connecting highways, or to a railroad terminal without a complementary railway system. Each airport added to the system enormously increases the value of all. The

An estimated registration of 400,000 civil aircraft by 1955 calls for an annual production of 43,000 civil aircraft in 1950 and 160,000 by 1955. Recent expansion of the operating portion of the aircraft industry indicates the easy accomplishment of this goal. Therefore, the future of a large segment of our war-born aircraft industry would seem assured. To realize this production a labor force of at least 400,000 would be required. California, continuing its present leadership, would logically supply nearly half that number.

In view of the past and projected growth of the civil aviation industry, it is not difficult to foresee in it an industry rivalling the automotive industry in potentialities and far-reaching effect on our economy. Airports are the all-important requirement to the attainment of this goal.

3. AIRPORTS

end goal is a system of airports adequately serving every part of the State and Nation, each complementing every other airport, each transcending purely local interest, each contributing its share to the free development of air commerce.

By investing 50 billion dollars in highways during the last thirty years, we have made it possible for the United States to become a nation on wheels—with 32 million motor vehicles in operation. For 2 percent of that amount judiciously expended to complete a national system of good airports, we can make the United States a nation on wings, with all that that implies, in war and peace.

To realize the maximum economic and military benefit to our country, the utility of the airplane must be increased. This calls for more airports—airports near the homes or places of business of potential users, airports convenient to all metropolitan areas, to National Parks and to recreational areas.

The sale of personal aircraft offers the brightest hope for a mass market which will maintain even a reasonable fraction of our 20 billion dollars a year aircraft manufacturing industry. Preserving a nucleus of this industry is important, both to the national economy and to defense, for it can provide a substantial source of employment and income in peace and assure us the weapons of war if need should again arise. California—the aircraft manufacturing center of the world—has a tremendous economic stake in the preservation of this industry.

The airport is the key to aeronautical progress, the basis of commercial supremacy and the foundation of adequate national defense.

A Review of Airport Development

Throughout the history of aviation the need for airports—better and more numerous—has been the serious concern of all proponents of civil and military aeronautics. Airport development has always lagged the technical development of the airplane.

In the earliest days of American aviation (1909-1911) the "airport" was usually a site which had served for an aviation meet or "exhibition" where the few aviators then available had gathered to demonstrate to the incredulous, the new marvel of flight. To have an exhibition there had to be a field. Local area clubs were the sponsors of both. Such fields were frequently the infield of the race track at the local fair ground, but in a few cases special sites were secured and dedicated as the local airport. A few such early sites, wisely selected, became the nucleus of modern, present-day airports; the others have long since been swallowed up in real estate development.

By 1911 when the first transcontinental flight was being slowly and painfully accomplished, with many stops and delays, there were about 20 recognized civil landing fields in the United States. The Signal Corps of the United States Army had purchased its first Wright Model B airplane which was being flown from the parade ground at Fort Myer, Virginia, across the Potomac from Washington. Most flying was then of a purely local nature, confined to the immediate vicinity of the few existing airports. But as the frail craft were improved and power plants became more reliable, it became apparent that the airplane was capable of performing useful work in cross-country travel.

In 1915 the Aero Club of America became the vigorous advocate of a chain of landing fields from coast to coast, on the analogy of the good-roads campaign which was then paving the way for the popular use of the motor car.

However, war in Europe centered interest in aeronautics upon its military aspects, and in 1917 when the United States entered the conflict, civilian flying was temporarily halted and all civilian pilots became the instructors of the vastly expanded military air arm. Eighteen months later, the Armistice found the United States with a well established Military Air Service; with a large industry for the production of airplanes and engines; with a huge surplus of completed aircraft beyond any apparent peacetime requirement; and with 15,000 trained military pilots. During the war the number of Army flying fields increased from 3 to 50, and the number of Naval air stations from 1 to 17; but very soon after the Armistice these numbers were reduced to 16 and 9 respectively.

The airplane had proven its utility in the grim business of war. Airports were the answer to its application in peace. The Aero Club campaign of 1915 was quickly renewed in a greatly enlarged form. "Airways" or chains of airports were planned in bold, straight lines across the country. As a result of the war, aviation had become the passionate interest of thousands who had sampled flying, and were convinced of its potentialities. In 1919 the Army, very conscious of the importance of civil airports to the free movement of military aircraft, organized a system of Army air-

ways, and offered advice to communities in the development of airports. The concept of the airport as a municipal utility had begun to appear.

At the same time the Post Office air-mail service had been established, the first regular air-mail being carried by Army aircraft on May 15, 1918 between a race-track on Long Island and a polo field in Washington. Within two years the air-mail reached California, and municipalities along the route had provided the fields upon which it was based.

The third and most important factor in keeping aviation in the public eye during this period was the activity of the "barnstormers," those war time pilots—determined aviation enthusiasts—who bought surplus military airplanes at bargain prices and penetrated every section of the country carrying passengers on short flights, giving exhibitions, taking aerial photographs and performing other useful services. They played an important part in the steady growth in the number of airports. By the end of 1920 the number had reached 271 of which 145 were municipal.

During the next two years the growth was slower and in 1923 the Aircraft Yearbook pleaded for a "National policy, wise planning, more intelligence and less emotion." Its admonitions are equally applicable today. It said "The remedy is better fields more wisely located—fields and terminals established according to natural commercial routes, not according to local fervor or whim."

The year 1924 saw the establishment of the first lighted airway by the Post Office Department, with the now familiar rotating beacons and intermediate emergency fields along the transcontinental air-mail route. This marked the entry of the Federal Government into the development of air commerce. Municipalities were protesting that in providing airports they were serving the general good far beyond their own interests. Many arguments were advanced for State and Federal aid to municipalities providing terminal airports.

By 1925 the municipal airports had increased to 310, the commercial fields to 225 and the Federal intermediate fields on the air-mail route to 66. The aviation boom of the late twenties was just beginning. Many municipalities began to seek a position for themselves on the nation's air routes. During the next two years the number of municipal airports increased 30% to 414.

Meanwhile, the Air Commerce Act of 1926, affording Federal recognition to the growing aeronautical industry had passed the Congress, but advocates of Federal aid in airport construction were disappointed with its specific prohibition against that policy. The act recited:

"The Secretary of Commerce is authorized to designate and establish civil airways, and within the limits of available appropriations hereafter made by the Congress, to establish, operate and maintain along such airways all necessary navigation facilities, except airports."

This prohibition remained in effect until passage of the Civil Aeronautics Act of 1938.

The transoceanic flights of the summer of 1927, especially that of Lindbergh, accelerated public interest in aviation. Many new municipal airports came into being following Lindbergh's triumphal tour upon his return from Europe: but more spectacular was the rush of speculative money into aviation. Elaborate chains of commercial airports were planned and con-

structed immediately prior to the stock-market collapse of 1929, after which this source dried up promptly. However, municipal expenditures for airport construction did not feel the full force of the depression until 1932. At the end of 1932 our inventory of and investment in civil airports was as follows:

TABLE 2
CIVIL AIRPORTS—1932

Ownership	Civil Airports		Construction Funds			Unit Cost Average
	Number	Percent/ Total	Source	Amount	Percent/ Total	
Public.....	717		Federal.....	\$1,094,328	0.7	
			State.....	2,905,869	2.0	
			Municipal.....	69,664,517	47.6	
Subtotal.....	717	45.1	Public.....	73,664,714	50.3	\$102,740
Private.....	872	54.9	Private.....	72,646,799	49.7	\$83,311
Totals.....	1,589			\$146,311,513		\$92,080

Source: CAA Airport Survey of 1939.

The foregoing tabulation includes all established, improved or partially improved civil airports, but does not include approximately 100 unimproved landing areas classed as "auxiliary" or "private" airports. Neither does the tabulation include 352 "Intermediate" Fields on the Civil Airways, established, improved and maintained at Federal expense for emergency use only, nor 51 Army and 15 Navy airdromes also established and maintained at Federal expense. Cost figures shown are cumulative to date and make no allowance for expenditures lost in airports abandoned, hence the average costs shown are somewhat high. However, the segregation of costs by sources of funds is significant.

The depression of 1930-33 had a decided effect upon the volume of use of airports. While scheduled air transport continued to increase, the volume of non-scheduled flying fell off approximately 35% and the net number of aircraft in use suffered a decline. Many cities which had provided airports during the boom

years of the late twenties were disappointed at the negligible business enjoyed. Yet all realized that the general state of business was responsible, and comparatively few airports were actually abandoned. There was always a coterie of aviation enthusiasts looking confidently forward to the return of normal times and holding out for the maintenance of the local airport facility.

The year 1933 marked the first and most important change in airport financing when the Federal Government, through the Civil Works Administration first made Federal funds available for airport construction. During the ensuing six years (1933 through 1938) the Civil Works Administration and its successors the Federal Emergency Relief Administration and Works Progress Administration expended \$137,931,950 in the construction of 640 new airports, and airport improvement projects totaling almost 2,000. This represented 76.7% of all expenditures for airports during the period, with 19.7% being added by sponsors and 3.6% being invested by private capital. Public airports bene-

TABLE 3
CIVIL AIRPORTS—1938

Ownership	Civil Airports		Construction Funds				Unit Cost	
	Number	Percent/ Total	Source	Amount	Percent/ Total	Percent/ 1932	Average	Percent/ 1932
Public.....	1,046		Federal.....	\$139,026,278	42.6	12,704		
			State.....	6,549,057	2.0	225		
			Municipal.....	101,459,232	31.1	146		
Subtotal.....	1,046	57.1	Public.....	\$247,034,567	75.7	335	\$236,170	230
Private.....	787	42.9	Private.....	79,208,544	24.3	109	100,636	121
Total.....	1,833			\$326,243,111		223	\$177,983	193

Source: CAA Airport Survey of 1939.

fited even more from Federal pump-priming in that 79.6% of all such expenditures were from the Federal Treasury with 2.1% contribution by States and 18.3% by local governments as sponsors' share. During this period the availability of Federal funds for public airport construction and the lack of attraction for private capital undoubtedly expedited the trend toward Federal financing and brought about the shift from private to public ownership of airports. At the same time it became evident that the airport is a municipal utility, comparable to highways, streets and bridges—a necessary adjunct to community well being.

The civil airport inventory and cost accounting at the close of 1938 demonstrates to what extent these changes had taken place:

Again the tabulation includes all established civil airports but omits approximately 190 unimproved auxiliary and private landing areas. Tabulation does not

include 267 CAA intermediate fields representing a Federal investment of \$4,539,000, nor 60 Army and 26 Navy airdromes of unknown Federal investment. As in 1932 the cost figures are cumulative but the following table, showing the cost and net gain in airports during the six year interval 1933 through 1938, indicates the high cost per public airport gained. The 130 percent increase in the average cost per unit is due largely to inadequate long-range planning and the consequent abandonment of over 300 of the public airports previously constructed. Similarly the average cost per private airport increased 21 percent although the number of such airports decreased 8.7 percent during the interval, despite the added investment of \$6,561,745. More permanent good was obtained per dollar invested in public airports than in private and the casualty rate in private airports was shown to be extremely high in times of recession:

TABLE 4
CIVIL AIRPORT DEVELOPMENT 1933-1938

Date	Public (Municipal)	Private (Commercial)	CAA Inter- mediate	All Others	Public and Private Totals	Grand Totals
INVENTORY						
December 31, 1938.....	1,046	787	267	160	1,833	2,260
January 1, 1933.....	717	872	352	101	1,589	2,042
Net Change.....	+329	—85	—85	+59	+244	+218
CUMULATIVE COST						
December 31, 1938.....	\$247,034,567	\$79,208,544	\$4,539,000		\$326,243,111	
January 1, 1932.....	73,664,714	72,646,799			146,311,513	
Net Addition.....	\$173,369,853	\$6,561,745			\$179,931,598	
Average Cost Per Airport Gained.....	\$527,000	(Loss)			\$737,425	

Source: CAA Airport Survey of 1939.

The Federal Airport Survey of 1939 completed by the Civil Aeronautics Administration by direction of the Congress, recommended among other things that the development and maintenance of an adequate system of airports be recognized in principle as a matter of national concern and that under certain conditions it be regarded as a proper object of Federal expenditure. It made no direct appeal to Congress for airport construction funds but recommended instead that airports be given higher priority in the public works program then being carried forward. The goal established called for a minimum of 3,500 civil airports by the addition of some 1,600 new airports and for the improvement to higher standards of the then existing 2,174 civil airports. No definite action on the survey was taken by the Congress and airport construction continued in a somewhat desultory manner under the various Federal Works Programs until 1940. In that year the survey proposals were reviewed and brought up to date, with the resulting indication of a need for 3,924 airports in the United States. Recommendations

for a National Airport Program were presented to Congress.

Although approximately 200 million dollars of Federal funds had been expended on airports and improvements thereto between 1933 and 1940, it was not until October, 1940 that Congress made its first direct appropriation for Airport Construction—an appropriation of 40 million dollars to the Civil Aeronautics Administration “for the construction, improvement, or repair of not to exceed 250 public airports—determined to be necessary for national defense.” This was the initial appropriation growing out of the Federal Airport Survey and Plan of 1939, which recommended a six year program to add 1,600 new airports at a total cost of \$560,000,000. It is well to note the strong emphasis placed on the national defense aspect of the program approved by the Congress. World War II was under way in Europe and America was beginning to realize its woeful lack of preparedness. Airport construction for national defense was destined to exceed

all previous expenditures during the next five years. It is well that the start was made in 1941.

Federal appropriations for the fiscal year beginning July 1, 1942 included \$94,977,750 for airport construction, \$33,500,000 of which was earmarked for the completion of the 250 projects undertaken in the 1941 program, and \$61,000,000 specifically allocated to 149 additional airport projects. As in the 1941 program, the national defense aspects were again stressed and Federal funds were limited to the construction of actual landing facilities. Sponsoring agencies were required to provide the land and guarantee the continued operation and maintenance of the facility.

With the expansion of the Army and Navy Air Forces authorized in 1941, the need for additional modern landing areas prompted two additions to the program, with the result that 668 locations were approved by the Congress for defense airports, and necessary

appropriations totaling almost \$400,000,000 authorized for their completion. This program of Defense Landing Areas remained in effect throughout the war years and has resulted in the construction of 688 projects at a cost to the Federal Government of \$373,400,000. These constitute, to a great extent, the modern new municipal and county airports and landing strips leased to the Military Services during the recent national emergency.

The DLAND Program (Development Landing Areas-National Defense) was conducted under the general supervision of the Civil Aeronautics Administration Airports Service, whose responsibilities included the development of suitable standards for all major items of construction, the consummation of all agreements relating to projects, and inspection of work in progress. Actual construction details were handled by other Federal agencies, usually by award

TABLE 5
DEFENSE LANDING AREA PROJECTS IN CALIFORNIA

Airport	Class	Sponsor	DLAND Expenditure	Wartime use	Map Code
Alturas Municipal No. 2.....	5	City of Alturas.....	\$690,943	Auxiliary.....	13-25
Bakersfield (Kern).....	5	County of Kern.....	214,069	Army Air Field.....	4-25
Banning.....	4	City of Banning.....	15,516	Auxiliary.....	3-35
Bishop.....	5	County of Inyo.....	366,660	Army Air Field.....	7-25
Concord (Buchanan).....	4	County of Contra Costa.....	550,857	Army Air Field.....	9-36
Crescent City.....	4	County of Del Norte.....	1,386,854	Navy Aux. Field.....	11-25
Daggett.....	5	County of San Bernardino.....	147,365	Army Mod. Center.....	3-45
El Centro (Seeley).....	6	County of Imperial.....	917,583	Marine Air. Station ¹	3-1
Humboldt-Arcata.....	5	County of Humboldt.....	599,342	Navy Experimental Station ¹	11-5
Inyokern (Harvey).....	6	County of Kern.....	380,097	Naval Air Station ¹	4-8
Little River.....	4	County of Mendocino.....	588,086	Navy Auxiliary Field.....	11-40
Long Beach Municipal.....	6	City of Long Beach.....	140,144	Army Ferry Base.....	2-28
Los Angeles Municipal.....	4	City of Los Angeles.....	35,099	Army Freight.....	2-29
Madera Municipal.....	3	City of Madera.....	297,059	Navy Auxiliary Field.....	6-45
Manzanar.....	3	County of Inyo.....	324,248	Miscellaneous.....	7-28
Merced Municipal No. 2.....	3	County of Merced.....	250,000	Army Auxiliary Field.....	8-35
Mojave.....	4	County of Kern.....	163,948	Marine Air Station ¹	4-9
Montague.....	6	County of Siskiyou.....	1,110,877	Auxiliary.....	14-31
Monterey.....	4	Airport District.....	1,554,256	Naval Air Station.....	5-41
Napa.....	4	County of Napa.....	1,155,162	Auxiliary.....	9-40
Needles.....	5	City of Needles.....	232,721	Auxiliary.....	3-46
Oakland.....	4	Port of Oakland.....	1,861,464	Naval Air Station.....	9-32
Oroville.....	5	City of Oroville.....	78,777	Army Air Field.....	12-31
Oxnard.....	4	County of Ventura.....	287,999	Army Primary.....	5-25
Palmdale.....	6	Irrigation District.....	37,525	Army Air Field.....	2-30
Palm Springs.....	6	City of Palm Springs.....	228,795	Army Air Field.....	3-37
Porterville.....	5	City of Porterville.....	496,395	Army Air Field.....	6-35
Red Bluff.....	3	City of Red Bluff.....	362,015	Navy Auxiliary Field.....	12-25
Sacramento.....	5	City of Sacramento.....	832,807	Army Air Field.....	10-25
San Francisco.....	6	City of San Francisco.....	1,319,430	Army Transport.....	9-25
San Luis Obispo.....	3	County of San Luis Obispo.....	663,632	Navy Auxiliary Field.....	5-36
Santa Ana.....	4	County of Orange.....	252,555	Army Air Field.....	2-38
Santa Barbara.....	4	City of Santa Barbara.....	1,020,033	Marine Air Station.....	5-30
Santa Monica.....	4	City of Santa Monica.....	835,757	Factory Test.....	2-32
Santa Rosa.....	4	County of Sonoma.....	337,404	Army Air Field.....	9-45
Ukiah.....	3	City of Ukiah.....	279,167	Army Auxiliary.....	11-41
Watsonville.....	4	City of Watsonville.....	769,511	Naval Air Station.....	5-15
Willows.....	4	County of Glenn.....	255,201	Army Auxiliary.....	12-36
Yuba-Alicia.....	5	County of Yuba.....	441,915	Army Air Field.....	10-36
			Miscellaneous		
Total.....			\$21,863,436		

¹ Still under lease to United States Navy at date of this report. All others in process of being returned to sponsor.
Source: Civil Aeronautics Administration letter of January 14, 1947.

of contract. Through this program the C.A.A. has developed the standards and processes which are incorporated in the new National Airport Plan now being undertaken.

The Defense Landing Area Program was intended primarily to provide the facilities needed by our military services in the defense of our frontiers against hostile invasion by air and to provide dispersal air-dromes for our greatly expanded Air Forces, for which reason the program was flexible in conformity to changing military needs. It served its purpose well and the 248 new airports constructed, together with the 287 enlarged and improved, are available for any future emergency.

Upon the completion of this huge war-time construction program of airports as an integral part of the National Defense program, involving the expenditure of almost \$400,000,000 in four years, the United States now has 1,600 more, highly improved airports than it had in 1940. Although military in conception, the secondary consideration of peace-time utility is now being realized, and a large percentage of them are being returned to the political agencies which provided the land. They should prove of permanent value both for national defense and to civil aviation.

California's share in this program involved the expenditure of \$21,863,436 of Federal money and included the construction or improvement of thirty-nine public airports in California. The list includes most of the higher class municipal or county airports in the State. These airports constructed as defense landing areas provided the basic facilities around which 16

Army Air Fields, 5 Navy Air Stations and 3 Marine Corps Air Stations came into being during the war. All others proved highly useful to the military services in training and transport operations.

The transition of our airports into higher classification by this program is pointed up in the following table:

TABLE 6
UNITED STATES AIRPORTS BY CLASSES

Class	April 1, 1940	Jan. 1, 1942	Jan. 1, 1944	Jan. 1, 1945	Increase 1940-45
1 and under-----	1,548	1,523	910	1,215	-333
2-----	245	702	774	936	691
3-----	29	187	430	464	435
4 and over-----	2	72	655	812	810
Totals-----	1,824	2,484	2,769	3,427	1,603

Source: Civil Aeronautics Administration Statistical Handbook.

In connection with the above inventory of airports, as of January 1, 1945, it is well to note the total estimated cost thereof, and the extent to which Federal funds have created our present system.

Table 7 shows an estimated total capital outlay of \$1,027,159,416, of which 72.1% is Federal money, 1% State, 18.8% local public agencies and 8.1% private capital. Obviously this 91.9% of public money expended on 66.8% public airports accounts for the vast majority of the higher class airports shown, since 8.1% private capital must be distributed over the remaining 33.2% of all airports.

TABLE 7
ESTIMATED CAPITAL EXPENDITURES FOR CIVIL AIRPORTS BY SOURCE OF FUNDS—THROUGH 1944

	Federal	State	Municipal	Commercial and Private	Total
Prior to 1933-----	\$1,094,328	\$2,905,869	\$69,664,517	\$72,646,799	\$146,311,513
1933-----	18,290,000	550,000	5,530,000	665,000	25,035,000
1934-----	18,290,000	550,000	5,530,000	665,000	25,035,000
1935-----	18,290,000	550,000	5,530,000	665,000	25,035,000
1936-----	18,290,000	550,000	5,530,000	665,000	25,035,000
1937-----	18,295,786	552,491	5,537,780	665,592	25,051,649
1938-----	46,476,164	890,697	4,136,935	3,236,153	54,739,949
Sub total to 1939-----	(139,026,278)	(6,549,057)	(101,459,232)	(79,208,544)	(326,243,111)
1939-----	28,435,000	250,000	16,930,000	820,000	46,435,000
1940-----	28,440,508	250,000	16,934,261	820,436	46,445,205
1941-----	136,200,000	776,000	14,406,000	700,000	152,082,000
1942-----	136,200,000	776,000	14,406,000	650,000	152,032,000
1943-----	136,200,000	776,000	14,406,000	600,000	151,982,000
1944-----	136,203,385	778,208	14,408,507	550,000	151,940,100
Sub total 1939-44-----	(601,678,893)	(3,606,208)	(91,490,768)	(4,140,436)	(700,916,305)
Totals-----	\$740,705,171	\$10,155,265	\$192,950,000	\$83,348,980	\$1,027,159,416
Percent of total-----	72.1	1.0	18.8	8.1	100.0

Source: Civil Aeronautics Administration Publication—"Airports and the National Economy."

To indicate partially the effect of this wartime defense program on California Airports the following Table 8 is included to show that California has received \$55,065,647 or 7.44% of all Federal expenditures in the various programs. An additional Federal allocation of \$8,970,859 to California airport construction by the Defense Plant Corporation and the United States Public Roads Administration added several

important airports and landing strips to the California airport pattern. Comparable statistics for the United States are not available for inclusion in the tabulation. The grand total of Federal funds expended in California for basically-civil airports through 1944 is therefore \$64,036,504, representing well over 90% of the total expenditure for civil airports to that date.

TABLE 8
FEDERAL EXPENDITURES FOR CIVIL AIRPORTS CUMULATIVE THROUGH 1944

Agency conducting program	United States				California
	Projects		Total	Expenditures	Expenditures
	New	Improve- ment			
Civil Works Administration.....	566	386	952	\$11,503,267	\$372,993
Federal Emergency Relief Administration.....	55	888	943	16,239,554	1,182,968
Public Works Administration.....		35	35	14,773,080	5,919,805
Work Projects Administration.....	197	367	564	331,089,971	25,726,445
CAA Defense Landing Area Program.....	248	287	535	367,099,299	21,863,436
Totals.....	1,066	1,928	2,994	\$740,705,171	\$55,065,647
California percent of United States total.....					(7.44)
Defense Plant Corporation.....					6,484,966
Public Roads Administration.....					2,485,891
Grand total—Direct Federal Expenditures in California.....					\$64,036,504

Source: United States—Civil Aeronautics Administration Publication "Airports and the National Economy."
California—Civil Aeronautics Administration letter of October 7, 1946.

A condensed history of the development of airports in the United States and in California by ownership and classes is presented in Table 9 which shows that California's percentage of total airports, as of June 1, 1945 was 7.6, a figure comparable to its percentage of total Federal aid, but that its percentage of all airports had declined steadily from 10.7 in 1929, when it lead all states by a wide margin, until it is now a poor second to Texas, with Florida and New York close runners-up. Moreover, its percentage of public airports has declined even more sharply from 34.8% in 1929 to 21.0% in 1946, while the national percentage has increased slightly in the same period. The one redeeming feature is that its percentage of airports in the higher classifications has increased to a higher figure than any other state, or than the national average, due largely to the Defense Landing Area program outlined above. At the same time, its percentage of Class I, or Private Owner Airports, is well below the national average, indicating a distinct lack of facilities in this category.

No other state has an aircraft industry comparable to that of California, which produced half of the aircraft used in World War II, adding immeasurably to

the State's wealth and economic standing. It is an industry in which every citizen has deep pride and interest, and which must be fostered and preserved in every possible manner. Californians own 10% of the Nation's aircraft with per capita ownership 50% above the national average. No state has better flying conditions, more scenic spots to attract, more need for air transportation between its far-flung cities, nor more per capita wealth with which to purchase aircraft. *The inescapable fact is that California has thus far left the development of its airport program entirely to chance and the vagaries of local interest—an expedient least exacting at the moment, but fraught with grave consequences in the future. An alert people cannot and will not countenance retrogression.*

Government Sponsorship

As has been shown, the trend in airport development has shifted, during the past twenty years, from private to public sponsorship, and from purely local to largely Federal financing. In so doing, it has been following an historic American pattern of governmental fostering of new forms of transportation which serve all of the people.

CALIFORNIA AIRPORTS

TABLE 9
DEVELOPMENT OF AIRPORTS BY TYPES AND CLASSES 1929-1946

Date	Type				Total	Class					Lighted
	Municipal	Commercial	Intermediate	All* others		Sub 1	1	2	3	4 and over	
October 20, 1929 (Earliest Records)											
United States.....	440	465	278	326	1509						499
Percent of total.....	29.2	30.8	18.4	21.6							
California.....	56	49	26	30	161	(CALIFORNIA LEADS ALL STATES— NEXT HIGHEST BY 60%)					41
Percent of total.....	34.8	30.4	16.1	18.7							
California, percent United States.....	12.7	10.5	9.4	9.2	10.7						8.2
December 31, 1930											
United States.....	550	564	354	314	1782						640
Percent of total.....	30.9	31.6	19.9	17.6							
California.....	61	54	24	26	165						60
Percent of total.....	37.0	32.7	14.5	15.8							
California, percent United States.....	11.1	9.6	6.8	8.3	9.3						9.4
December 31, 1935						Airports not classified until 1938					
United States.....	1047	822	291	214	2368						698
Percent of total.....	44.2	34.7	12.3	9.0							
California.....	78	74	20	20	192						65
Percent of total.....	40.6	38.5	10.4	10.5							
California, percent United States.....	7.4	9.0	6.8	9.3	8.1						9.3
December 31, 1938											
United States.....	1046	787	267	160	2260	63	1897	178	36	none	719
Percent of Total.....	46.3	34.8	11.8	7.1		2.9	87.2	8.2	1.7		
California.....	72	73	19	13	177	2	144	17	5	none	63
Percent of Total.....	40.7	41.3	10.7	7.3		1.2	85.7	10.1	3.0		
California, percent United States.....	6.9	9.3	7.1	8.1	7.8	3.2	7.6	9.6	13.9		8.8
						(Classifications in 1938 and 1940 exclude Military Airports)					
December 31, 1940											
United States.....	1031	860	289	151	2331	1488	304	46	9		776
Percent of Total.....	44.2	36.9	12.4	6.5		80.6	16.5	2.2	0.7		62
California.....	65	74	17	18	174	(Not available for State)					
Percent of Total.....	37.4	42.5	9.8	10.3							
California, percent United States.....	6.3	8.6	5.9	11.9	7.5	(CALIFORNIA STILL HOLDS SLIGHT LEAD)					8.0
July 1, 1945											
United States.....	1099	1226	223	1144	3692	383	1007	996	470	836	1006
Percent of Total.....	29.8	33.2	6.0	31.0		10.4	27.3	27.0	12.7	22.6	
California.....	61	76	12	133	282	28	65	64	28	97	92
Percent of Total.....	21.6	27.0	4.3	47.1		10.0	23.0	22.7	10.0	34.3	
California, percent United States.....	5.6	6.2	5.4	11.6	7.6	7.3	6.5	6.4	6.0	11.6	9.1
						(CALIFORNIA NOW SECOND TO TEXAS)					
July 1, 1946 (Latest Records)											
United States.....	1339	1760	209	998	4306	496	1301	1178	488	843	1012
Percent of Total.....	31.1	40.9	4.9	23.1		11.5	30.2	27.4	11.3	19.6	
California.....	69	125	12	122	328	30	87	84	30	97	92
Percent of Total.....	21.0	38.1	3.7	37.2		9.1	26.5	25.6	9.1	29.7	
California, percent United States.....	5.2	7.1	5.7	12.2	7.6	6.0	6.7	7.1	6.1	11.5	9.1
						(CALIFORNIA A POOR SECOND)					

* "All Others" includes private, miscellaneous government owned, Civil Air Patrol, Army, Navy, Army-Operated and Navy-Operated airports. (The latter two groups are municipal or commercial airports temporarily taken over by the Army or Navy

during the war.) Prior to 1935 this category also included unimproved "Auxiliary" airports.

Sources: 1929-35 Air Commerce Bulletins; 1938 CAA Airport Survey of 1939; 1940 CAA Journal of January 15, 1941; 1945 and 1946 CAA Statistical Handbook.

Since the earliest times, governments have been called upon to supply those services which were required in the public interest to promote the common good and the general welfare. Not the least of these have been those services concerned with public transportation.

Historically such undertakings include the improvement of waterways and harbors and the construction of

early-day canals. Later, large grants of land and rights of way were given to the railroads to aid them in bridging the continent and in opening new lands for development. When it has appeared in the public interest, the government has subsidized shipping. It has built and maintained lighthouses and aids to ocean navigation. More recently, automotive transportation and the huge automotive and allied industries have been encouraged

by the expenditure of billions of dollars in Federal-aid highway programs undertaken since 1916. The approximate extent of such Federal subsidies is indicated in the following table:

TABLE 10
TOTAL FEDERAL EXPENDITURES IN
TRANSPORTATION FIELDS

Transportation Field	Years Covered	Expenditure
Waterways.....	1822-1944	\$2,972,884,405
Railroads.....	1850-1941	498,100,071
Highways.....	1894-1940	6,518,835,000
Shipping Subsidies		
Operation.....	1936-1944	46,454,961
Construction.....	1936-1944	188,944,526
Lighthouse.....	1917-1940	248,909,793
Total.....		\$10,474,128,756

Source: CAA Publication — Airports and the National Economy.

Brought up to date the imposing total shown above would approximate \$15,000,000,000. In comparison to these activities the expenditures upon civil aviation have been very small, the grand total cost to the Federal Government of air mail service, airways construction and operation, airport construction, research and other civil aviation programs being considerably under 7 percent thereof.

Many of the facilities provided under Federal sponsorship of civil aviation have returned their entire cost by their availability to the military services during war-time emergency. The expansion of our Air Forces to the stature reached during World War II would have been virtually impossible without greater emergency expenditures for airways and airports than the actual peace-time investment which they represent. The tempo of our war-training program would have suffered had not these facilities been available. Federal contributions to civil aviation may therefore be said to have been amortized by their war-time contribution to national defense.

Moreover, civil aviation facilities provide a constant service to the military establishment. It is impossible to distinguish between civil and military interest. If no civil aviation existed, a large portion of our present civil aviation facilities necessarily would be maintained at Federal expense in order that our military air forces might efficiently fulfill their mission of national defense. On this basis alone Federal participation in the development of civil aviation is justifiable.

The balance sheet on government aid to earlier forms of transportation shows that the cost has been regained, not only in money, but in contributions to the general welfare through the impetus given to commerce and the broadening of the whole national economy. Aviation is already emerging from the subsidy stage, having paid off the air mail deficits of twenty-five years in the past three years. Aside from national defense

returns, the balance sheet must include the increased productivity of American industry brought about by the efficiency of air mail and air transportation; the savings effected by large scale surveys of land, timber and other resources by air over older methods; the value of aircraft in forest fire control, pest control, crop seeding, major calamities and many similar uses; and the many intangible benefits, not measurable in dollars, of this newest and fastest form of transportation across the nation's broad expanse. The full benefits are yet to accrue, but many which justify our government's interest already have been realized.

This conception of governmental responsibility is recognized in Section 2 of the Civil Aeronautics Act of 1938 which provides that the public interest and public convenience and necessity shall be construed to include:

"The encouragement and development of an air transportation system properly adapted to the present and future needs of foreign and domestic commerce of the United States, of the Postal Service, and of the national defense; the regulation of air transportation in such a manner as to recognize and preserve the inherent advantages of, assure the highest degree of safety in, and foster the sound economic conditions in, such transportation; * * * the regulation of air commerce in such a manner as to best promote its development and safety; and, the encouragement and development of civil aeronautics."

To carry out this policy calls for a system of airports adequate to the present and future needs of air commerce, the Postal Service and national defense and for suitable airways connecting them. At the very minimum it calls for a system which provides service to all major commercial centers of population—a system which adequately serves the commerce and people of the country. Moreover, safety considerations dictate airports of adequate size at proper intervals. National defense considerations have already been enumerated.

The obligation of the Federal Government to foster and sponsor a national system of airports and airways is therefore established by the basic obligation of government to provide the best in transportation for the common good and general welfare and also by the announced policy of the Congress as expressed in the Civil Aeronautics Act of 1938 and in the National Airports Act of 1946, discussed in a following section.

It may be said, therefore, that there is general agreement upon the desirability and necessity of a long-term Federal program to aid the development of a national airport system. The war has hastened the development of aviation in America, and the continued financial and technical resources of the Federal Government are essential if the Nation is to obtain the maximum economic, social and military values of the age of flight. The Congress has demonstrated an awareness of the importance of a national system of airports

and a willingness to appropriate large sums of money over a period of years to assist in the construction of that system.

But the development of transportation is not only a Federal function. It is likewise a responsibility of state and local government. Behind the general agreement upon the desirability of a national airport system there is the important consideration of whether that system shall be developed by the proven pattern of federal-state-local cooperation or its development be attempted by an unconventional plan of federal-local cooperation. The manner in which this question is answered will largely determine the success of the program for establishing the new airport system.

The states are inevitably involved in any nationwide airport program. State planning for the development of airports is an absolute essential to the success of a national system. Planning out of Washington can coordinate and provide leadership but it can never accomplish the adaptation to local conditions and needs that can be secured at state level. Nor can the development of a system be left to the varying response and independent action of thousands of local communities. There must be active leadership and coordination in the development of airport plans and projects and equitable distribution of Federal funds allocated to the several states, otherwise competition for available funds between active local governmental units would preclude systematic development, while lethargy or lack of interest in other localities would develop large voids in the projected national system.

As a consequence of inadequate funds for matching Federal aid many localities badly in need of airport facilities will be unable to complete their portion of the program. As has been pointed out, the goal of the national airport program is to make air transportation available to every section of the Nation and to make every section of the Nation accessible to the air traveler. Until that is accomplished there is no national airport system. A similar goal must be the objective in each of the forty-eight states with Federal coordination between their several plans. Hence it is inescapable that the states assume jurisdiction over the allocation of Federal aid within their borders and render financial assistance wherever necessary to the completion of their portion of the national program. The states' pre-examination of local plans and projects is therefore a matter of administrative wisdom and sound economy. Certainly nothing worthy of the term "system" can be accomplished without Federal aid and state control and coordination and without state aid in rounding out an otherwise spotty, disjointed and incomplete local pattern.

For many years states have administered large highway and other public works programs involving cooperation with Federal agencies. State aviation agencies having competent technical personnel available to polit-

ical subdivisions for planning and advice, are better prepared to deal with the problems of airport planning and construction than are the individual localities which they would represent.

From the viewpoint of the Federal Government's own problem of administration there are numerous advantages in maintaining relations with the forty-eight states rather than with thousands of political subdivisions throughout the Nation. The federal-state-local pattern meets the test of administrative simplicity and places the responsibility for developing a complete and thoroughly integrated national *system* of airports squarely upon the three levels of government where it naturally falls; the Federal Government for the country as a whole; the state government for the Nation's principal geographical subdivisions; the local governments for the individual airport projects. This method is of proven efficiency. Over a period of thirty years it has been employed successfully in the carrying out of sound programs for the development of highways, agriculture, public health, vocational education, and social security. These programs have been uniformly successful, the most conspicuous achievement being in the development of the Nation's highways. In the perspective of years it becomes increasingly evident that our great system of highways owes its existence largely to the principle of federal-state partnership established by the Federal Aid Road Act of 1916. By the same token, and in exactly parallel circumstances, our projected national system of airports may come into being most expeditiously and efficiently through federal-state-local cooperation under the Federal Airport Act of 1946.

War Effect on Airport Development

As has been shown the Defense Landing Area Program (DLAND) of the Civil Aeronautics Administration, created many fine, large airports throughout the country which proved highly advantageous to the war effort. Following the outbreak of hostilities, these airports were taken over by the services, along with scores of older public airports, for important military functions. In many cases the original construction work had not yet been completed when the Army Corps of Engineers or the Navy Bureau of Yards and Docks moved onto the scene to begin construction of runway extensions, taxi strips, hardstands, parking mats and the necessary housing and other facilities to render the airports useful as main or auxiliary military airfields.

This work continued throughout the war period and the military services enlarged or improved 395 such occupied or leased airports and built 591 new military airfields in the United States at a total outlay of \$1,112,-841,880 for landing areas, and \$2,025,684,760 for buildings and utilities incident thereto. While all of this huge amount is chargeable to the war cost, some of it provided extensive additions to permanent military establishments such as Hamilton and March Fields of the

Army Air Forces, and Alameda and North Island Naval Air Stations. Many entirely new air bases were constructed which will remain as permanent additions to our military establishments. Mather Field, San Bernardino Air Depot, Los Alamitos Naval Air Station and El Toro Marine Base are examples in this group.

The major portion of this wartime outlay, however, was expended on facilities made necessary by a greatly expanded military training program which was promptly terminated at the war's end to be resumed only in case of a new emergency. Included in this category are the civil airports, taken over by the services and improved for special military uses, which are now being returned to their original owners with all improvements. Included also are numerous entirely new training fields, excess to military requirements in peacetime, now being offered to nearby governmental subdivisions to become units in the system of Civil Airports, such transfer being conditioned only upon their continued maintenance as airports by the recipient, and their being available to the government in the event of future emergencies. Bakersfield, Monterey and Stockton Airports are examples of civil airports being returned with extensive military improvements, while Hammer Field at Fresno, and Chico Army Air Field are examples of newly constructed fields now available for civilian use.

The extent to which existing civil airports contributed to the war training program, and the number of additional military airfields required by the expanded military air arms, is indicated by the following breakdown which includes only the wartime development, and excludes all permanent military establishments existing prior to 1942:

Civil Airports Occupied by Military During War—58	
Portion of above total still occupied by Military—	4
Main Bases—	4
Portion of above total declared excess. Returned to Civil	
Aviation	54
Main Bases—28, Auxiliary Fields—26	58
New Military Fields Developed During War Period—109	
Portion of above total retained as post-war Military—	33
Main Bases—22, Auxiliary Fields—11	
Portion of above total declared excess. Available to Civil	
Aviation	76
Main Bases—36, Auxiliary Fields—40	109

While exact figures on wartime expenditures of this nature in California are not available, it is estimated by reliable and informed sources that at least \$250,000,000 were expended on airport construction and improvement in the State during the war. One hundred nine new airfields were built of which seventy-six are now excess and fifty-eight occupied civil airports were improved in varying degrees. The estimated value of the new civil airports thus being acquired, and the value added to civil airports during military occupancy, is conservatively estimated at more than \$100,000,000.

Thus California has acquired a substantial capital investment and improved its airport pattern materially as a by-product of the war. But not all of the airport development so gained can be justified at present or in the immediate future, on the basis of civil aviation's needs. Nor should it be! This was an investment of the taxpayers' money for National Defense. It was a part of the huge war cost for survival and should be so considered. Having once made this huge investment it appears only logical that the State and Nation should protect its interest by maintaining these facilities for a continuing National Defense Program which is as vital now as at any time in the past, meanwhile utilizing them as best we may in civil pursuits.

It has been contended that, because some of the installations now being returned to cities and counties are more extensive than present civil aviation requirements in the community, and because these over-developed airports present serious financial and maintenance problems to the smaller governmental units, they should be abandoned in whole or in part. No policy could be more shortsighted. With the development of civil aviation anticipated within the next ten years nearly all of these facilities will prove to be valuable assets. Moreover, these airports were and are now necessary for the defense of our country and must be maintained for that purpose if for no other. Federal maintenance on a standby status would prove more expensive than local deficit financing required to maintain the airports as civil public utilities. Where local governments are unable to assume the responsibility, the ultimate solution may be found in State or Federal assistance. The problem is worthy of serious study and search for an equitable solution.

Certain it is that the airport pattern in California has been materially improved by wartime developments and community expenditures for major airports under the National Airport Plan will be materially reduced as a consequence. This will permit concentration upon the smaller airports and airparks so necessary to the full development of private air transportation, which in turn is vital to the preservation of our aircraft manufacturing industry.

Public Versus Private Ownership of Airports

The question suggested is not one to be feared or avoided, but is a very real problem in planning and economics, to be met squarely without emotion and with full realization of its ultimate portent. It does not concern the propriety of private investment in airports, for under the American system of private enterprise, the right of capital to invest in facilities of the public transportation system is unquestioned. It does not depreciate the role of the privately owned airport in the development of aeronautics to date, nor suggest that private airports or airparks are not equally important

to its future growth. It does not, in any sense, imply that government should enter into competition with well established private airports.

Rather, it is a question of protecting the public interest in aeronautics as a vital new system of transportation in a rapidly changing economic era. It is a question of public recognition of the obstacles attendant to the development and maintenance of a facility which, in order to survive, must meet demands far in excess of the needs of its local customers. It is a question of who may best underwrite the development of adequate aeronautical facilities in advance of actual requirements, as a basic necessity for the ultimate development of aviation and air travel, which growth to date and the most conservative predictions indicate is probable.

As has been shown, the intrinsic and essential long-distance character of aviation results in an interest in every airport which goes far beyond local considerations, and which vitally affects the economy of large areas. In providing such facilities it is therefore essential that the cost be spread over the broadest base possible, which can only be done under a system of public ownership. This principle has been recognized for decades in the construction of highways and harbors, in the reclamation of land and in the improvement of streams for navigation and flood control. No one suggests that such projects be undertaken by private capital, but everyone expects that private capital will utilize such public improvements as aid to private enterprise and for public and private gain—for the good of the general public. Thousands of new enterprises, even whole communities, have come into being as a result of good highways and improved harbors. Public yacht harbors have long been considered proper communal enterprises, and the capital investment required of sufficient public interest to be justifiable. Private capital has provided docks, ship-yards, repair facilities and supply establishments which have flourished as a result of the original public investment.

When this conception is applied to aeronautics, the community becomes responsible for providing the land and developing the actual landing area around which all of the private enterprises may be established, each paying its proportionate share for the use of such public facilities. Until this principle is recognized, both public and private capital will be expended in illogical channels. If it is reasonable that actual landing and terminal facilities be considered as proper objects of public expenditure (as is recognized in the Federal Airport Act) and that hangars, shops and flight operations be left for private enterprise, then it is equally reasonable that the developers of such enterprises be spared the capital investment in the basic facilities which serve, not only their own needs, but the needs of aviation and the community generally.

A pattern of privately-owned airports, each developed only to the extent that present local needs will

justify is comparable to the highway pattern of a generation ago when each city or town developed only such local streets and roads as it could finance or justify. It was not until the broad base of State and National highway financing was established that the present system of inter-city highways became possible, with all that it implies in the development of the automotive age and its kindred enterprises. In exactly the same manner, and to the same extent will the development of a system of public airports stimulate the air age and the development of a whole new chain of private enterprises around those airports. Then, and only then, can the system become self-sustaining on the same broad basis as our present highway or harbor system is self-sustaining.

Increasing land values, property taxes, encroachment of hazards to flight, lack of adequate capital and many other considerations mitigate against private airport development and permanence. Experience has shown that as land becomes increasingly valuable for subdivision the private airport goes out of the picture just when its preservation as an airport is most desirable. Further, many private airports, originally developed in rural areas have been forced out of business by abatement proceedings brought by adjacent property owners, whose interests were more recently acquired as residential subdivisions approached the airport boundaries. This has happened and is happening repeatedly in the more populous centers of California and other states. Private enterprise has neither the legal facilities nor the capital reserve to protect itself against such hazards. Moreover, most private airports now in existence are developed upon land leased for relatively short periods, to protect the owners thereof against losses through enhancement of land values.

Suitable airport sites thus removed from the pattern are lost forever to aviation except at prohibitive cost of re-acquisition.

That there is or can be no permanence in private airports is clearly indicated by reference to Table 11 which shows Airport Attrition in California from 1929 to date. Of 49 Private airports in existence in 1929 only 11 remain today—an attrition rate of 77.5%, while in Public (or municipal) airports the rate is only 30.7% and most of the public airports abandoned have since been replaced by better, more advantageously-located public airports.

The accompanying photographs indicate the fallacy of dependence upon private airports for the present and future needs of aviation. The Alhambra airport shown was, in its heyday, one of the finest airline terminals in the country, constructed at a cost of \$1,000,000. By modern standards the airport was entirely too small for airline use and its area of 188 acres was so restricted that expansion was impossible. It was abandoned by the airline in less than two years, as larger aircraft demanded greater runway lengths and clear approach lanes. However, it was still a good Class

TABLE 11
AIRPORT ATTRITION IN CALIFORNIA
A 1946 ROLL CALL OF 161 AIRPORTS IN CALIFORNIA, OCTOBER 20, 1929

	Public	Private		Federal		Total
	Municipal	Commercial	Auxiliary	Intermediate	Army-Navy	
1929 List Shows.....	56	49	21	26	9	161
1946 Rollcall—Same List.....	39	11	8	6	3	67
Out of Existence.....	17	38	13	20*	6†	94
Percent Lost—Each Category.....	30.36	77.55	61.90	76.92	66.67	58.39
Percent of Total Lost.....	18.08	40.43	13.83	21.28	6.38	100%

* High attrition in "Intermediate" category is due to new CAA policy of greater spacing between intermediate fields, and to the availability, in recent years, of municipal airports along airways serving the purpose for which intermediate fields were originally established.

† Army-Navy loss due to replacement by larger airports in vicinity.

Source: Air Commerce Bulletin, December 2, 1929, and Field Check, October, 1946.

2 airport and as such it served for fifteen years, as a base for commercial and private flying, and as a test field for an aircraft factory. It was entirely satisfactory for such purposes and advantageously located to serve a large population group in the Los Angeles Metropolitan area. It figured prominently in the Los Angeles County Master Plan of Airports of 1940. But rising land values proved too tempting to its owners, and in the second photograph is shown an excellent airport subdivided and a housing project in full swing. True, housing is vital in a growing community, but the few remaining suitable airport sites may in the near future become equally valuable as airports in the congested urban areas.

The second series of pictures show a pioneer airport of Los Angeles which served both airline and non-scheduled aviation for several years. But a growing city swallowed it up and courts administered the coup de grace at the behest of neighboring property owners whose interests were acquired with full knowledge of the airport's existence. The result—the owners of this airport and its tenants moved five miles further from their homes and places of business into then open country, where the process is being repeated. All private capital invested in the airport was lost and the site is permanently lost to aviation. Similar instances are constantly recurring in metropolitan areas. Private airport owners cannot cope with the odds against them. Had either of the airports pictured been publicly owned many elements would have been in their favor which under private ownership actually hastened their demise.

Increasing land values would not have imposed higher taxes prejudicial to continued use of the land for airport purposes. Surrounding construction might have been controlled by zoning to purposes consistent with airport use. Residents of the locality would have a pride of ownership in the project if publicly owned. It has been demonstrated in several metropolitan centers that the existence of permanent public airports

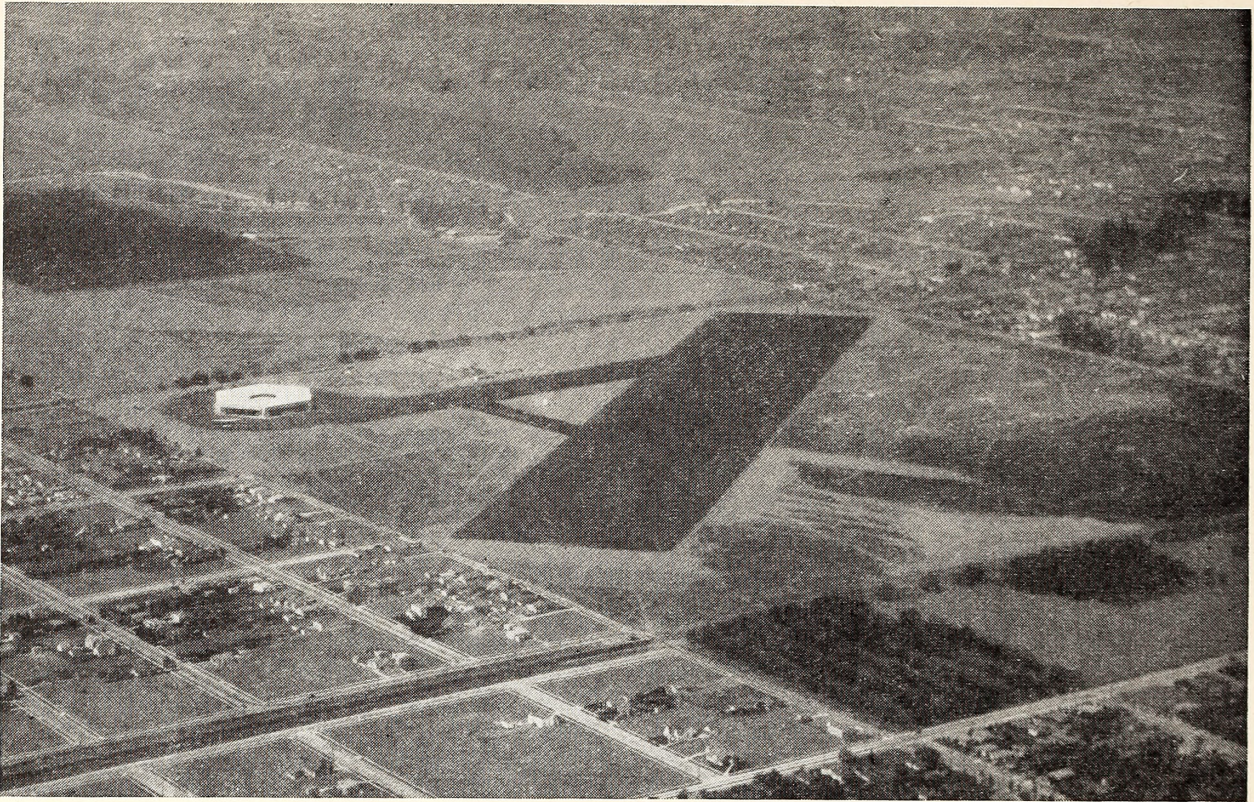
of the higher types has increased the value of neighboring property.

As was pointed out in a preceding section, public funds have developed two-thirds of the country's airports and represent 92 percent of the total investment through 1944. Almost 100 percent of the larger and better airports are publicly owned. All major cities of the country now have one or more public airports, and at least half the cities between 5,000 and 25,000 population are also on the aerial map under public sponsorship.

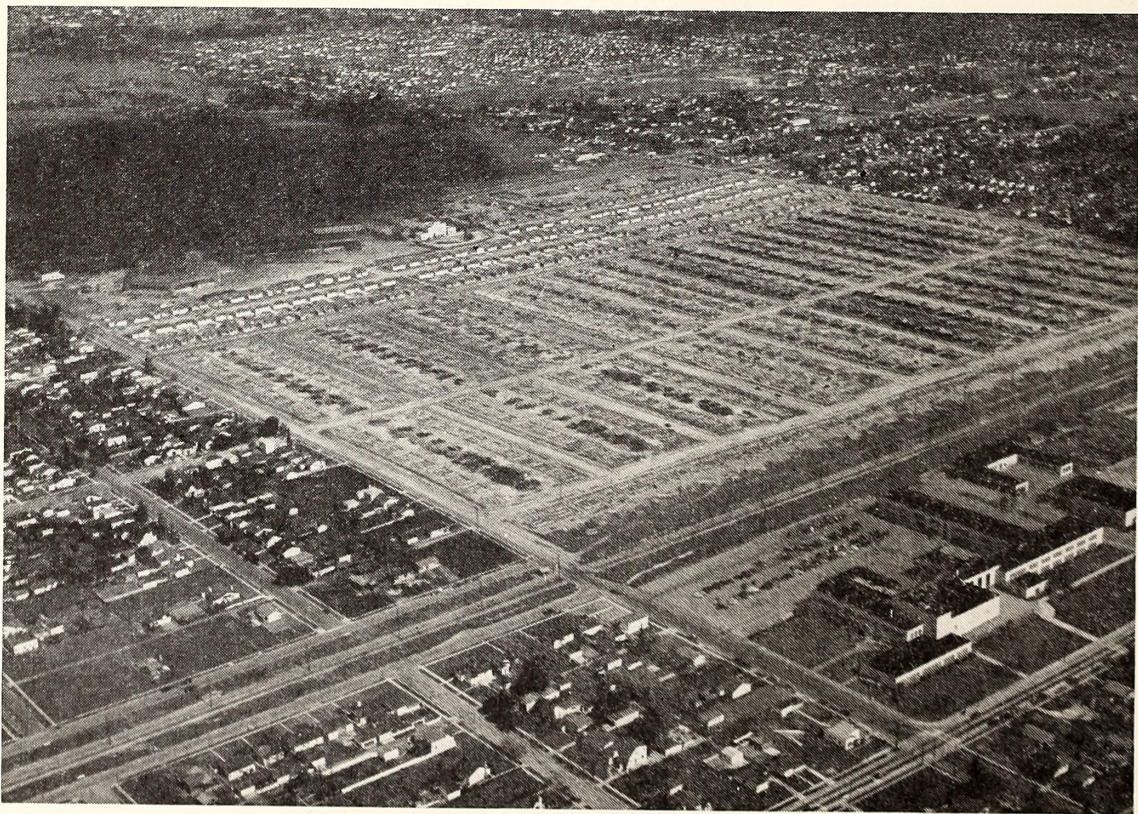
Private airports, in the main, have been developed to serve non-scheduled aviation in areas where need has not been recognized by civic officials. There can be no quarrel with this practice, except the lack of permanence and the complete lack of protection under law which the owners and developers of such facilities constantly face. A degree of permanence might be attained if responsible governmental officials were to acquire first option to purchase such facilities, if and when the owner desired to dispose of his interests. A degree of protection to private airports might be afforded by recognition of their role under law, with suitable limitations upon abatement proceedings and the application of all possible protection, to private airports serving the public, under zoning powers.

A third alternative, often suggested, is the dedication by the owner of the landing area only to public use, reserving for himself the adjacent land and its use privileges. Under such circumstances the runways, taxiways, ramps and air navigation facilities would be eligible for public maintenance and improvement with public funds and the users thereof would pay only the necessary rentals to support the project.

Regardless of the status of ownership, however, any airport is of considerable interest to the public. All airports may be required for military use in time of national emergency. Further, whether a busy airport is public or private, the public must provide highway connections to join it with the community, other-



ALHAMBRA AIRPORT
1929



LOST TO AVIATION—1947



WESTERN AVENUE
1929



SAME VIEW—1947

wise adjust highway, park and other plans to relate the airport property to other facilities, sometimes undertake considerable drainage programs as the result of grading the airport, and otherwise regulate effects of the airport. The public is therefore vitally interested in seeing that there will be, not merely sufficient airports in the community, but that investment in them be permanent and that they be properly located to serve the community's best interests.

The National Airport Plan and Program

The passage of the Federal Airport Act of 1946 (Public Law #377 of the 79th Congress) gave Federal recognition to several important principles. It reaffirmed the government's interest in fostering public transportation media for the general welfare. It reestablished the proven policy of Federal-State-Local cooperation in public works programs. It recognized the fact that the provision of adequate airports is as much a governmental function as the building of highways, bridges or harbor facilities. It gave tacit admission to the fact that our airport system is not yet complete, despite huge wartime expenditures on major airports.

The avowed purpose of the program is to construct 3,050 new airports and improve 1,625 of the existing 3,200 civil and military airports of Class 1 or larger. Emphasis is placed upon the need for Class 1, 2 and 3 airports of principal benefit to non-scheduled and private flying. As shown by Table 6, recent new construction has increased Class 4 and larger airports from 2 in 1940, to 812 in 1945, while Class 1 airports have shown a decline from 1,548 to 1,215 in the same period. In keeping with the policy to foster private flying as the best method of maintaining an aircraft industry, it is vitally necessary that private owner airports be provided wherever justifiable.

The end result of the program will be 2,597 Class 1; 2,198 Class 2; 654 Class 3 and 856 Class 4 or larger airports, a total of 6,305 to adequately serve 99% of the Nation's population.

The Federal Airport Act provides for the preparation and annual revision of a National Airport Plan which will show those projects most vitally needed during each ensuing three year period throughout a seven year program, beginning July 1, 1946. It authorizes annual appropriations up to \$100,000,000 by the Congress to an aggregate amount of \$500,000,000 for the Federal share of a \$1,000,000,000 airport construction and improvement program. As stated by Mr. T. P. Wright, Administrator of Civil Aeronautics, "It is the Nation's first *planned* effort to develop a civil airport system worthy of the name."

Annual appropriations made under the Act are divided into three funds as follows:

5% to an Administrative fund for necessary research, planning and administrative expense.

75% of the remainder to the states on the basis of one-half in the proportion which a State's population bears to the population of all the states, and one-half in the proportion which its area bears to the total area of all the states.

25% of the remainder to a discretionary fund to be allocated by the Administrator, in the manner which he deems most appropriate for carrying out the national airport plan regardless of the states in which such projects are located. This fund will be used also to aid airport development in National Parks, Monuments, Forests and recreational areas.

California's share of the 75% allocation is approximately \$18,500,000 which may be augmented by a reasonable part of the discretionary fund. With sponsors' funds added, this represents a seven year airport development program in California of approximately \$55,000,000.

It is anticipated that this amount will add approximately 150 new airports and improve to higher standards another 125 airports in California during the life of the program. Where these new airports are, or will be required, and which airports shall be improved, and to what extent, is the basic purpose of this study. A continuity of planning and study is the prime prerequisite for the judicious expenditure of this huge amount.

Section 3 of the Federal Airport Act directs the Administrator (of Civil Aeronautics Administration) to **"prepare, and revise annually, a national plan for the development of public airports * * * specifying, in terms of GENERAL LOCATION and TYPE OF DEVELOPMENT, the projects * * * necessary to provide a system of public airports adequate to ANTICIPATE and meet the need of civil aeronautics. In formulating and revising such plan, the administrator shall take into account the needs of both air commerce and private flying, * * * the probable growth and requirements of civil aeronautics."**

The annual airport construction program within each state will consist of projects of highest priority selected from the current National Airport Plan within the limits of appropriated and allocated funds. Priority of projects will be determined by the aeronautical necessity alone, it being the sole basis for fixing locations and specifying classes of projected airports. Factors such as cost or the ability of sponsors to match Federal funds shall not be confused with aeronautical necessity. In general it has been found that the aviation activity of an area determines its need for airports in one or more of the following ways:

(a) Airports required to accommodate the actual or potential air traffic in the community where present facilities are inadequate or non-existent.

(b) Airports which provide needed landing facilities at intervals along natural routes of air travel.

(c) Airports located at places that people want to reach by air—recreational areas, national parks, beaches, vacation resorts, hunting and fishing grounds, for example.

The 1947 National Airport Plan has been developed by the Civil Aeronautics Administration, as required by law, with the above factors considered. Any one, or combination of these factors may have been used in a specific instance. The size of airports proposed is related to the performance characteristics of the type of aircraft expected to use the facilities as outlined in a subsequent section. Size has also been influenced by the anticipated volume of air traffic of these same aircraft.

The Federal Airport Act provides that only after regularly apportioned funds have been allocated to justifiable projects without supplying the urgent needs, can discretionary funds be used to supplement state apportionments.

In the closing days of the 79th Congress the sum of forty-five million dollars (\$45,000,000) was appropriated (Public Law No. 490) to carry out the purposes of the Federal Airport Act during the remainder of the fiscal year of 1947. That sum has been apportioned as follows:

Federal Aid Airport Program Appropriation—			
Fiscal Year 1947	-----		\$45,000,000
Projects in Alaska, Hawaii and Puerto Rico	-----		1,740,000
<hr/>			
Net total for Continental United States	-----		\$43,260,000
Less Administrative Expenses 5%	-----		2,163,000
<hr/>			
Net total for construction projects in United States	-----		\$41,097,000
To Discretionary Fund (25%)	-----		10,274,250
<hr/>			
For apportionment to States (75%)	-----		\$30,822,750
On Population Basis	-----	\$15,411,375	
On Area Basis	-----	\$15,411,375	
California shares in the 75% apportionment to States as follows:			
<i>Population Basis</i> (1940 Census)			
California	6,907,378		
		= 5.246013% =	\$808,483
United States	130,669,275		
<i>Area Basis</i> (Land and Water Areas)			
California	158,762 Square Miles		
		= 5.126728% =	790,099
United States	3,096,751 Square Miles		
<hr/>			
Total Direct Apportionment to California	-----		\$1,598,582

Since the Federal Airport Act specifically provides that projects relating to Class 4 or larger airports shall be submitted to the Congress for approval, and since such procedure was not possible in the 1947 program, no allocation of funds to projects of this type were made from the above funds.

In California any public agency, or two or more public agencies acting jointly may submit to the Administrator project applications in such form and containing such information as he may prescribe, and

setting forth the airport development proposed to be undertaken. **No project shall propose airport development not included in the then current revision of the national airport plan.** All proposed development shall be in accordance with standards established by the Administrator, including standards for site location, airport layout, grading, drainage, seeding, paving, lighting, and safety of approaches.

Federal aid on airport projects is established for California at 54.12 percent of the allowable project cost on airports of Class 3 or smaller, and 54.12 percent on the first \$5,000,000 of allowable costs on Class 4 or larger airport developments. On Class 4 or larger airports on which Federal expenditures exceed \$5,000,000, the Federal contribution is reduced by 5 percent for each increment of \$1,000,000 up to \$11,000,000, after which the Federal share is fixed at 24.12 percent.

Allowable project costs include:

(1) Necessary cost incurred in accomplishing the airport development in accordance with the plans submitted with project applications, if incurred subsequent to execution of the grant.

(2) Necessary cost of formulating the specific plans even though incurred prior to execution of the grant, but subsequent to the enactment of the Federal Airport Act.

(3) The cost of administration buildings is an allowable cost. The cost of hangars is not allowable.

Federal aid also applies to the cost of acquiring land and interests in air space in connection with the development of airports, by specifying that 25 percent of such costs are allowable in connection with Class 3 or smaller airport developments and not exceeding 25 percent of such cost in connection with Class 4 or larger airport developments.

Project sponsorship entails providing the Administrator with satisfactory evidence that the public agency holds good title to the landing area of such airport or the site therefor or gives satisfactory assurance that such title will be acquired; that the agency has sufficient funds available to cover its portion of the project cost; that the agency has legal authority to engage in the airport development proposed; that the project will be completed without undue delay, and that all sponsorship requirements have been or will be met.

The Act specifically provides that airports developed thereunder must be protected against encroachment of obstacles to flight, either by suitable zoning ordinances or by outright purchase of land or air easements and includes the cost of such necessary purchases under land acquisition costs eligible for 25% Federal participation. Further, it provides that the cost of relocating, removing or lighting existing hazards shall be an allowable project cost. The importance of this provision for permanency of facilities constructed is obvious since many valuable public and private airports have sustained irreparable harm in this manner

CALIFORNIA AIRPORTS

TABLE 12
SUMMARY OF 1947 FEDERAL AIRPORT PROGRAM

State	Pro rata State Allocation	Pro- jects in Pro- gram	Federal Funds Committed			Sponsors Match- ing Funds	Grand Total Com- mitted	Balance of State Allocation Uncom- mitted	Percent of State Allocation Com- mitted	Rank by Per- cent
			From State Allocation	From Discr. Fund	Total					
Alabama.....	\$591,213	0						\$591,213	None	48
Arizona.....	625,320	9	\$384,926		\$384,926	\$256,177	\$641,103	240,394	61.56	41
Arkansas.....	492,437	17	492,437	\$20,369	512,806	680,834	1,193,640		104.14	30
California.....	1,598,582	33	902,966		902,966	1,046,721	1,949,687	695,616	56.48	43
Colorado.....	650,276	9	410,671		410,671	380,658	791,329	239,605	63.15	40
Connecticut.....	227,839	5	227,839	81,156	308,995	335,195	644,190		135.62	11
Delaware.....	43,172	1	43,172	8,878	52,050	64,250	116,300		120.56	19
District of Columbia.....	77,955	0						77,955	None	
Florida.....	522,151	15	504,895		504,895	517,800	1,022,695	17,256	96.69	34
Georgia.....	658,863	17	658,863	33,382	692,245	749,228	1,441,473		105.07	29
Idaho.....	477,266	45	477,266	514,015	991,281	847,966	1,839,247		207.70	2
Illinois.....	1,212,617	10	1,212,617	214,626	1,427,243	1,615,143	3,042,386		117.70	20
Indiana.....	582,951	15	562,601		562,601	663,351	1,225,952	20,350	96.51	35
Iowa.....	577,179	18	481,127		481,127	574,667	1,055,794	96,052	83.36	37
Kansas.....	620,260	35	620,260	640,400	1,260,660	1,434,450	2,695,110		203.25	3
Kentucky.....	534,101	13	534,101	71,922	606,023	920,823	1,526,846		113.46	25
Louisiana.....	523,220	14	523,220	63,149	586,369	721,496	1,307,865		112.07	27
Maine.....	269,947	6	262,292		262,292	269,293	531,585	7,655	97.16	33
Maryland.....	274,397	7	274,397	38,853	313,250	352,550	665,800		114.16	24
Massachusetts.....	551,120	15	551,120	156,558	707,678	827,511	1,535,189		128.40	15
Michigan.....	1,096,900	30	1,096,900	257,327	1,354,227	1,521,746	2,875,973		123.46	16
Minnesota.....	756,211	41	756,211	226,339	982,550	1,275,480	2,258,030		129.93	12
Mississippi.....	495,837	10	475,781		475,781	497,912	973,693	20,056	95.96	36
Missouri.....	789,721	32	789,721	570,568	1,360,289	1,533,465	2,893,754		172.25	5
Montana.....	797,733	46	797,322		797,322	743,638	1,540,960	411	99.95	31
Nebraska.....	538,393	9	163,902		163,902	228,206	392,108	374,491	30.44	45
Nevada.....	563,019	1	45,110		45,110	30,666	75,776	517,909	8.01	47
New Hampshire.....	103,834	13	103,834	58,961	162,795	184,335	347,130		156.78	6
New Jersey.....	527,839	7	527,839	90,343	618,182	997,308	1,615,490		117.12	21
New Mexico.....	667,735	10	667,735	81,148	748,883	595,969	1,344,852		112.15	26
New York.....	1,846,180	7	1,846,180	293,145	2,139,325	2,155,075	4,294,400		115.88	22
North Carolina.....	680,372	10	680,372	368,345	1,048,717	1,118,717	2,167,434		154.14	7
North Dakota.....	426,809	20	243,243		243,243	297,103	540,346	183,566	56.99	42
Ohio.....	1,030,860	5	696,040		696,040	748,454	1,444,494	334,820	67.52	39
Oklahoma.....	621,432	23	621,432	130,769	752,201	899,570	1,651,771		121.04	18
Oregon.....	610,420	32	609,826		609,826	623,174	1,233,000	594	99.90	32
Pennsylvania.....	1,388,042	27	1,388,042	500,744	1,888,786	1,922,886	3,811,672		136.08	10
Rhode Island.....	89,605	2	89,605	25,145	114,750	124,750	239,500		128.06	16
South Carolina.....	377,601	3	103,000		103,000	107,500	210,500	274,601	27.28	46
South Dakota.....	458,690	19	458,690	188,446	647,136	616,223	1,263,359		141.08	9
Tennessee.....	551,531	14	436,790		436,790	530,171	966,961	114,741	79.19	38
Texas.....	2,081,311	70	2,081,311	156,520	2,237,831	2,739,129	4,976,960		107.52	28
Utah.....	487,007	17	487,007	258,083	745,090	484,590	1,229,680		152.99	8
Vermont.....	89,867	5	89,867	13,933	103,800	140,475	244,275		115.50	23
Virginia.....	524,064	8	524,064	150,936	675,000	712,500	1,387,500		128.80	14
Washington.....	554,509	16	554,509	162,907	717,416	842,884	1,560,300		129.38	13
West Virginia.....	342,959	3	342,959	334,096	677,055	677,055	1,354,110		197.42	4
Wisconsin.....	696,774	25	696,774	979,786	1,676,560	2,432,586	4,109,146		240.62	1
Wyoming.....	516,629	3	177,630		177,630	135,070	312,700	338,999	34.38	44
Total.....	\$30,822,750	792	\$26,676,466	\$6,690,849	\$33,367,315	\$37,174,750	\$70,542,065	\$4,146,284	108.26	

Total Allocation to States.....	\$30,822,750	100%	Total Discretionary Fund.....	\$10,274,250	100%
Total Allocation Committed.....	26,676,466	86.55%	Total Discretionary Fund Committed.....	6,690,849	65.12%
Balance State Allocated Uncommitted.....	\$4,146,284	13.45%	Balance Discretionary Fund Uncommitted..	\$3,583,401	34.88%

Source: American Aviation, January 15, 1947.

in the past. In fact the encroachment of hazards to flight has caused the abandonment of many pioneer airports.

Stage construction is permitted, in fact encouraged, under the Act, and communities are urged to make long range plans and acquire the necessary land by purchase or option to permit expansion by stages to meet the ultimate requirements of the area. In this manner Class 1 or 2 airports initially constructed may be enlarged by subsequent projects to Class 3 or 4 airports as communities grow and aviation develops during the life of the program.

There is at present no legal authority for the State of California to exercise any direct control over the distribution within the State of Federal Airport Funds allocated to the State. Such final allocation to individual projects must therefore be made by the Administrator of Civil Aeronautics or his representative, upon the basis of need shown in the current National Airport Plan. Nor is there any authority for State participation in matching Federal funds although it would appear obvious that communities are not equally able to supply aviation facilities which ultimately serve all of the people of the State and Nation. As has been pointed out, airports are not sufficient unto themselves. Each depends upon all others and is of maximum utility only when the pattern is complete. For this reason, it is imperative that the larger elements of government

participate in providing the needed facilities, that the cost thereof be spread over the widest possible base and that the value of the system and the possibility of return on the investment be appraised from a Statewide or Nationwide viewpoint. The analogy of the state highway system is equally applicable in distributing the cost of an adequate airport system.

That California is falling still further behind in airport development is evident from a study of Table 12, presenting a summary of the 1947 Federal Airport Program. It will be noted that the communities of California submitted only 33 projects which utilized only 56.48 percent of the State's 1947 allocation of Federal funds, whereas 36 states used all, or nearly all of their allocation and 30 states dipped heavily into the discretionary fund, in several cases more than doubling the state allocation. California with its 4 National Parks and 18 National Forests, comprising one-fifth of its area, should benefit greatly from the discretionary fund, yet we find other more aggressive states the principal benefactors. California ranks forty-third of the 48 states in utilization of its 1947 allocation. This fact is a clear indication that the State's interest cannot be left to chance and the varying response of hundreds of local governments. An aggressive program planned by the State for the best interests of the entire State is essential to the success of the Federal Airport Program in California.

4. AIRPORT FINANCING

Benefits of Adequate Airports and Relationship to Financing

Airports may be regarded as a special form of public utility of great importance, not only to the municipality where they are located, but to all, however remote in the State or in the United States, who use or may wish to use the airport as a means of communication. As a result, the earlier view that an airport should be run like any other business enterprise, be in a position to pay its own operating expenses and provide for amortization of capital invested, must yield to the conception that the airport, as a public utility, performs a necessary public service, and must be financed accordingly.

A large part of the services of an airport are intangible and immeasurable. Although it is of the utmost importance to the public interest that airports be managed efficiently, that every effort be made to have them become entirely self-supporting or as self-supporting as possible, no airport can be termed useless simply because its budget must be supplemented by public funds. Every airport in the State of California, and even in the entire United States, forms a link in an integrated communication system. It would be as unjust to require each airport, regardless of its importance

to the entire system, to prove financially solvent as it would be to demand that each separate strip of a highway be justified by the volume of local traffic on that strip.

The State benefits directly or indirectly from all the airports within its borders. All these airports are part of a State-wide communication system integrally necessary for adequate development of regional commerce, and one of the State's primary interests is the promotion of commerce from a State level. It is readily observable that airports are of great importance to the municipalities, and the State is, in a certain sense, the resultant of the collective interests of these municipalities. It does not follow that the State should subsidize one form of competitive transportation. The main responsibility of the State towards airports is statutory assistance, planning and promotional aid, and well-considered regulation. It is possible, however, to conceive of certain cases when an airport might be indispensable to the overall air transportation system and yet remain unbuilt because the local cities were unable or unwilling to proceed. In such an instance, the State might be justified in taking steps to have the airport constructed.

A municipality benefits in many ways from an attractive, well-planned airport. At first glance, the city dweller is won by the possibility of financial returns in

rentals and fees. Probably the least of the benefits accruing from an airport, however, are those convertible out of hand into dollars and cents. The most important by far are those intangible, social and long term advantages—those benefits conducive to the citizens' happiness, which no accounting system devised to date can accurately evaluate.

As soon as the first airplane lands at the field, the citizen has a feeling of personal satisfaction in the knowledge that the city in which he dwells is modern and progressive. He thrills with pride because his city is at last on the air map. Seventy years ago, his grandfather had the same ethical reaction when the railroad was built in his direction and his city was placed on the railroad map. When the airport is opened, the citizen is able to inspect an attractive new city utility. He can visit the field and watch the complex aeronautical activities—a fascinating spectacle in itself. The airport will doubtless have new recreational facilities—a restaurant, possibly a club room and swimming pool. There will be a feeling throughout the city that the municipality has made a wise expenditure of money and acquired a worthwhile, permanent improvement.

Going beyond these intangible benefits, an airport assures many long term economic and social advantages for a municipality. Rapid air service is now available for the city's inhabitants and produce, and gives it a competitive advantage over cities not similarly served. The local merchants have a closer connection with branch offices; business trips by air are possible throughout the United States. Local tourist attractions, probably not fully developed hitherto, are accessible, after the airport is built, to visitors coming by air from the entire nation. Citizens interested in private airplanes now have field and storage facilities at hand. The most cautious may even recall instances when the existence of a local airport has proved a decisive factor in the critical importing of supplies and medicines after some natural catastrophe. Not to be overlooked are the benefits to a city of an airport considered as any new business activity. The concessions and services at the field create an additional market for employment and commodity sales.

Opportunities for Self Support

Although, as already stated, it is probably impossible for all airports to be entirely self-sustaining, there are many methods by which their revenue could be increased. This problem makes imperative a prior decision on the nature of airport management. There seems to be a general consensus at present that for various reasons it is best for the municipality itself to operate the landing area operations and turn over to private control the concessions and business activities. To make the airport as self-supporting as possible the management should thoroughly canvass every possibility and aggressively develop all potential sources of income.

Airport financing should start with the installation of a modern budget system based on standard financial practice and cost accounting. Such a system permits an accurate proportioning of charges among the different users of the airport—the commercial air carriers and private flyers. There is relatively little objection to the amount charged for service fees when these charges can be justified by budget figures showing the exact basis of cost allocation. A complete budget system is also essential if the municipality expects the airport to approach self-support as rapidly as possible.

The landing area operations managed by the municipality itself include aviation fuel and oil sales; commercial, private, and itinerant aircraft service; and the rental of office space for operators, storage facilities for express and freight; and hangar space. An up to date accounting system will permit a fair pro-rating of these service and rental charges among the users of the airport. Although probably impossible at the start, it should be the ultimate aim of management to set these charges sufficiently high to cover operating costs, maintenance, depreciation, interest, and amortization of capital invested in the field itself.

Special attention should be directed to the peripheral airport activities, both with a view to augmenting revenue and establishing a new civic attraction. These activities can be managed best by private lessees and concessionaires. The concessions can be allocated on the basis of highest bids guaranteeing a certain percentage of the gross profits. The lessees must be made clearly responsible for conducting an establishment of a type that will add to the airport's attractiveness as a community center.

The exact nature of the community center developed at the airport will depend on the needs and size of the municipality. Even minor airports have found it profitable and in the public interest to make provision for a dining room, some recreational facilities such as a swimming pool or club room, ground transportation to and from the airport, a garage and parking lot, and a service station. In several smaller cities such a restaurant has at once become known as the best in town and proved a dependable source of income.

A major airport can be made an integral part of decentralized suburban planning and thus become a community and recreational center in itself, operated as a self-supporting unit, and regarded as a continuing source of pride by all the citizenry. Because of downtown parking congestion, many cities are experiencing a decentralization of recreational and shopping centers. Major airports can take advantage of this tendency and be made as self-contained as possible.

The larger airport may find several food concessions profitable: a main dining room, a coffee shop, a cafeteria for employees and a soda fountain. It is advisable to have some form of hotel with rooms for transients, and possibly with apartments for employees. The shopping center might include a newsstand, phone

booths, a drug store, a bakery, a bank, a barber shop, a beauty parlor and a gift or novelty shop. Recreational facilities should be planned to attract the patrons of the airport, the employees and the citizens at large. Bowling alleys, hand ball courts, a small auditorium, a club room and a swimming pool are all possible. A small exhibition building for aeronautical equipment can be useful to both dealers and prospective buyers. Some of the largest airports have let advertising contracts. Favorite advertising media are arrival and departure boards and airport newspapers. Provision must be made for ground transportation to and from the airport. A parking lot, garage and service station should be well patronized.

5. AERONAUTICAL ACTIVITIES

Scheduled Flying

Civil Aviation, as distinguished from the military, is divided broadly into two general categories, scheduled and non-scheduled. The former term embraces the domestic and international air carriers, certificated by the United States Civil Aeronautics Board, under the terms of the Civil Aeronautics Act of 1938, for the transportation of passengers, mail and/or cargo over a specified route or routes upon a regular schedule of operation. It serves the public convenience and need wherever it is shown that the establishment of regular air transport schedules is economically feasible. As has been indicated, this phase of civil aviation came into being just twenty years ago with the establishment of the first commercial air carrier routes across the continent and between its principal cities. Authorized route miles have increased eight-fold since that date, while miles flown annually are seventy times the early-day figure. Table 1 presents other interesting indications of the spectacular development of domestic air carrier operation which is now coming of age. Although the problems incident to postwar conversion and expansion brought serious difficulties to all of the air carriers, and the growth curve of 1946 showed a sharp break downward in the early fall, it is now again on the up-swing, and each month of 1947 is surpassing the corresponding month of 1946. The scheduled air carriers are now in position to adequately handle the increased volume of business through their equipment modernization programs.

International scheduled air carrier operation is much younger than the domestic phase, having been delayed somewhat by the lack of suitable aircraft for long over-water flights. Although international service in the Western Hemisphere began in 1928, it was not until 1935 that the first trans-Pacific service was inaugurated, and not until 1939 that the first trans-Atlantic schedules were established. Nevertheless, in 1939, international air carriers of the United States contributed 8.5 percent of the total air carrier mileage flown.

Only the largest metropolitan airports could include all these attractions. Smaller fields should incorporate as many as will satisfy local civic requirements. All municipal airports, however, should be planned with these desiderata as a goal. The local airport can be either an unsightly, necessary nuisance, confined to air depot operation, with the plane operators and owners paying part of the bills, or the pride of the community, a center of public interest, and a potential revenue-producer. Such a self-contained and self-supporting community attraction will help fill the municipal treasury, aid in airplane sales and bring more passengers to commercial lines.

Commercial operation of transoceanic routes from the United States were scarcely established when war broke out and the armed services, both directly and by contract, undertook to move unprecedented quantities of materiel and personnel abroad by air. In three years, the mileage flown exceeded by six times all of the international operations of United States airlines in the previous sixteen years. While international air transport had developed steadily and in a healthy manner prior to the war, its expansion during and since the war has been spectacular, and the race for advantageous position among the nations of the world since the war has led to over-expansion of routes in point of current demand for such service. However, the potential business is or will be available with the readjustments of the world economy and international aviation will unquestionably develop rapidly as a means of world-wide communication and commercial intercourse. This subject is treated more at length in Section 5 of Part V.

Although air mail once represented the chief source of revenue for scheduled air transport, it has steadily decreased in importance to approximately ten percent of gross operating revenues, while passenger revenue has steadily increased to seventy-two percent of the total. The remaining eight percent presently represents cargo revenue. In this latter field recent developments indicate the greatest potential source for expansion of revenue and route as volume cargo becomes available to permit corresponding rate reductions. Again the subject is covered in detail in a subsequent treatment of Air Cargo Projections, Section 4 of Part V.

One other new phase of scheduled aviation—the Feeder Line—is worthy of particular mention. In the postwar expansion of civil aviation, the Civil Aeronautics Board has recognized the need for local air carrier service to many intermediate-sized cities not included in the prewar pattern of scheduled air carrier service. While this need has been supplied in part by the inauguration of a “skip-stop” system on the major airlines passing over or near certain communities, the sys-

tem does not provide true feeder service, nor does it adequately serve local inter-city traffic. In anticipation of popular demand that passenger and mail air service be made available to all population centers in the post-war era, a literal flood of route applications for "Feeder Lines" were presented to the Civil Aeronautics Board during the war period. Since 1945 the Board has granted many such applications and has added more than 17,000 route miles of local Feeder Line air service to the national airline pattern. Certification of these new routes has, in each case, been for a temporary three-year trial period. Many of the routes authorized have been slow in starting service due to equipment shortages and substandard airports at the cities which they proposed to serve. Not all such route applications have been granted. There must be shown a need and a demand for the service and the possibility of financial success.

California has been granted one such feeder route by which Southwest Airways now provides local service to all cities on the coast route between Los Angeles and San Francisco, feeding passengers into both terminal points for transfer to major airline. Similarly, Southwest serves the coast cities north of San Francisco, again connecting with the major airline at Medford, Oregon. It also provides local service between Medford and San Francisco via the Central Valley cities, as well as between all other cities along its route. So successful have been its operations during the first six months of service, that Southwest is now seeking additions to its route which would provide similar service throughout the eastern portion of the State, and also provide the transverse ties which to date have been entirely lacking. As pointed out elsewhere in this study, there is serious lack of adequate transportation facilities between the Central Valley cities and the coastal resort cities, except in the San Francisco Bay Area. Cognizance has been taken in this study of the airport needs to supply Feeder Line service to all portions of the State not now served by scheduled air transport and the Scheduled Aviation Projections—Section 2 of Part V—include estimates of the potential passengers available annually at each such point for 1950 and 1955.

6. TYPES OF AIRPORTS

Air Transport Terminals

There are certain requirements that are characteristic of all fields to which a regularly scheduled service is to be efficiently rendered. There are others that characterize only the airports that serve major traffic centers, usually at terminals or at the junction of two or more routes. Of the 300 cities now served, something more than a half have no more than ten scheduled arrivals per day and a like number of departures. In a

Non-Scheduled Flying

The second general category to be considered in airport planning is that catch-all phrase of non-scheduled or non-air carrier flying, which literally includes all aviation activity not described under the previous heading. It includes charter and contract commercial services, instructional flying, flying in connection with a business or profession, industrial flying such as crop seeding, dusting or pest control, aerial photography and mapping, personal business or pleasure by the private owners of aircraft, and all other phases of aeronautics not included in the province of scheduled air carrier flying.

Although made up of a multitude of small businesses and operations, the total flying activity in this branch of aviation greatly exceeds the more concentrated and better publicized air carrier operations. While the latter group rolls up more mileage per aircraft, non-air carrier planes in the aggregate, account for two-thirds of all flying. In 1942 United States domestic and international air carriers flew 130,000,000 miles which was less than half the 294,000,000 miles flown by non-scheduled aviation. Because of the war-time dislocation of non-air carrier flying, statistics for the war years are not available. However, the total aircraft in this category has increased from 26,000 in 1942 to 84,000 at the close of 1946, and 88,755 as of March 1, 1947. Mileage comparisons for 1946 are on the order of 305,962,344 for the scheduled air lines (Table 64), as against an estimated 1,260,000,000 for non-scheduled aviation (Table 69).

The greatest single opportunity for expansion in the aeronautical industry is in the encouragement of private flying—in making the country truly a nation on wings. By the same token, the greatest need of civil aviation is for the airport facilities which will make such growth possible and probable. In light of postwar growth, the prediction of 400,000 non-scheduled aircraft by 1955 seems entirely possible and reasonably certain of attainment.

large proportion of those cases, it is unlikely that the number of daily arrivals and departures will need to exceed two per hour for some years to come. In such cases as that, transport traffic presents no threat of actual congestion of airport facilities.

There are, on the other hand, certain terminal fields that offer a very different problem. The total numbers of scheduled arrivals and departures at the leading centers of air traffic during a recent six months period were:

TABLE 13
AIRCRAFT OPERATIONS AT 10 LEADING AIRPORTS
(January-June, 1946)

	Air Carrier	Itinerant Army- Navy	Itin- erant Civil	Local Army- Navy	Local Civil	Total	Aver- age Day	Peak Day (150 Per- cent of av- erage Day)	Peak Hour (7 Per- cent of Peak Day)
1. La Guardia.....	69,726	3,218	8,878	2,156	11,704	95,682	526	789	55
2. Chicago.....	56,119	5,172	11,135	2,096	11,866	86,388	475	713	50
3. Washington.....	49,504	15,011	8,963	2,613	10,973	87,064	478	717	50
4. Miami.....	37,644	4,489	2,142	6,341	33,563	84,179	463	695	49
5. Los Angeles.....	36,974	2,199	6,791	634	6,057	52,655	289	434	30
6. Detroit.....	*								35
7. Dallas.....	30,278	12,625	11,975	21,169	8,074	84,121	462	693	49
8. Pittsburg.....	29,097	751	5,228	246	10,447	45,769	251	377	26
9. Kansas City.....	27,044	848	6,361	189	60,453	94,895	521	782	55
10. San Francisco.....	25,803	4,254	4,334	2,281	21,087	57,759	317	476	33

* Relative position estimated from April figures which are only one reported to CAA during period.
Source: American Aviation for October 1, 1946.

Obviously in the case of such points as Los Angeles and San Francisco, with an average of 1 arrival or departure about every 5 minutes throughout the 24 hours, and much more than that in the late afternoon and early evening, congestion can be a very real factor. Municipalities entertaining air traffic on that scale have already arrived at the necessity of thinking of airports in the plural. Considerations of safety demand that the immediate zones of landings and take-offs for transport operations be freed from the less-practiced and less-disciplined conduct of the private pilot and the student. Even were there no question of segregation of types of operation to avert dangerous congestion, there are other reasons for providing a multiplicity of airports for a great metropolitan area.

It is upon the field used by scheduled air transport that attention is fixed for the moment, and for the moment, it is important only to note that there are two categories. There is the airport for which transport demands constitute only a relatively light load, thinly spread over the 24 hours, upon the airport's facilities; and the airport on which the load is heavy and continuous. Though it is obviously impossible to draw a sharp line of division between the two, the division may be roughly imagined as separating the points that have more than 30 scheduled arrivals and departures each day from those that have less. There are, of course, many airports that now have substantially less than 30 schedules a day, but are entirely likely to reach that figure, and to present the problems of intensive and congested operation, within so near a future that the airport should even now be planned for it.

The difference between the major terminal or junction point and the intermediate stopping place of a few transport schedules is not limited to buildings and the facilities for the handling of traffic. It extends even to the required physical dimensions of their landing areas. There has been an increasing disposition in re-

cent years to maintain both express and local services along the main traveled air routes. The tendency that way seems likely to continue to grow; and for a variety of reasons, some obvious and others minutely technical, it is desirable to use for the express services aircraft that require, for safety, larger take-off and landing spaces than those which are entirely satisfactory for machines planned more particularly for handling local traffic with frequent stops.

The late war and the cargo aircraft developed during the past five years have demonstrated the need for mile-long runways at all major airline terminals. Post-war designs of transport aircraft will require runways of such length for safe operation at maximum load conditions. Requirements for runway length are not alone a matter of aircraft performance but also include operational problems incident to all-weather flying. Obviously it is much easier to hit a large target than a small one. For exactly the same reason it is easier and infinitely safer for an aircraft to approach, locate and successfully land on a long runway under adverse weather conditions than to accomplish the same landing safely upon a runway barely adequate under optimum conditions. For this reason, and not because aircraft designers have raised landing requirements, modern transport airports are being planned with runways of 7,500-10,000 foot length.

Multiple runway systems are incorporated in all modern plans to permit simultaneous take-offs and landings, thus more than doubling the operational capacity of the same or slightly larger airport area. The accompanying photographs illustrate the change in concept of air transport terminals in California in the past fifteen years and point up the modern conception of adequate air transport terminal facilities.

In summation it may be stated that Class 5 airports are the minimum size which may be considered reasonably adequate for today's air transport terminals and

that for reasonable safety and adequacy under all-weather flight operation Class 7 airports having 7,500 foot runways will soon be considered essential.

Airports for Non-Scheduled Flying

In this category are found several different classes of airports easily distinguished from the air transport terminal. There is the airport, not serving a major center of population, which takes care of scheduled as well as non-scheduled operation. There is the airport, serving a great metropolis, which provides for the non-scheduled flying in order that it and the regular air transport, the latter conducted through another field, may be freed from the danger of one another's interference. There is the general-purpose airport for the community that has no scheduled operation. There is the frankly subsidiary field, to be scattered in adequate numbers throughout the outlying portions in a large area of high population density. There is the airport of purely recreational purpose. And there are others, specialized in various degrees, to be mentioned.

Of the field that serves both scheduled and non-scheduled operations, little need be said. It is the requirements of scheduled air transport that impose as a rule the most severe conditions upon its design and construction, and if it meets the requirements of the scheduled service it will automatically give the non-scheduled operators and the private flyers most of what they require. To suit the airport wholly for their miscellaneous purposes, there should be some additional space in buildings and some additional facilities for mechanical servicing; and if the volume of non-scheduled operation is expected to be very large, as in the case of an airport used by flying schools, its hard-surfaced runways should be supplemented by a large sodded area, smooth enough and well enough drained to permit the landings and take-off of lighter aircraft under any ordinary conditions. Of the airports now in use in the continental United States, nearly 200 are in this group.

The fields that carry the non-scheduled share of the air traffic of a metropolitan area with enough traffic to require that it be divided are subject to requirements depending on the local situation. They should be lighted; they should have some radio facilities; they should have a large sodded area suitable for landings and take-offs, but with hard-surfaced runways for use in particularly bad weather. At present few cities have made a rigorous separation of their scheduled and non-scheduled operations, but there are several airports on which the air-transport traffic so dominates the scene that most of the non-scheduled operators and private flyers have been quite willing to go elsewhere.

The fields that serve areas that have no direct service by scheduled air transport fall also into several groups. There are the airports of the urban communities, which have for one reason or another not become a point of call of any transport line, and the airports of

the smaller towns and rural trading centers. There are the regional, or suburban, fields that serve the subdivisions of a large metropolitan area that has a single base for transport operations, and that may also have a single major non-transport airport on which charter services and schools are based, but which in addition, needs smaller fields on a proper geographical dispersion for the primary use of the private owner or renter of aircraft. There are the airports that serve recreational areas, such as the National Parks, to make them easy of access by air.

It is a difficult matter to draw even the most general specifications for such classes as these. The need depends on the individual case; but in general it can be said that no community is properly served with an airport for non-scheduled flying, and spared the danger of having to depend on its neighbors for some of its facilities for such flying, unless it has runways of adequate length and suitable for use in all weather. It can be said with still greater certainty that the field must have boundary and obstruction lights, and be suitably marked for night identification, and that it should have available aircraft storage space and supplies of fuel and oil and mechanical service on call at all times.

The suburban field may be of more modest proportions. It need not be a primary reliance in really bad weather or in emergency, for it is a secondary facility of a region that offers much larger and better-equipped airports within a few minutes' flight. It is however desirable, though perhaps not essential, that such fields should be lighted adequately for night use in ordinary weather. Specifications for runway length will be discussed elsewhere in this report.

The airport serving a recreational area falls somewhat into the same category as that providing for a small city without scheduled air transport service, except that availability for night operation is less important. Such areas are of first-rate importance, and have been too much neglected. The possibility of visiting them by air is one of the major attractions of private flying. In some cases recreational areas are of such significance as to need transport service and an airport of corresponding quality, rather than mere provision for private visitors by air.

In general it may be stated that airports required for non-scheduled aviation are those in the Class 3, or at a very minimum, Class 2 variety.

Private Owner Airports

Airports in this category, popularly known as "Airparks," are designed for small private-owner type aircraft up to 4,000 pounds gross weight to provide small communities with minimum airport facilities, and larger metropolitan areas with the necessary auxiliary airports upon which the growth of private flying is so vitally dependent. Normally, no pavement is required where suitable turf covering may be maintained, but

landing strips with clear approaches must measure 1,800 to 2,700 feet long and 300 feet wide. The specifications for Class I airports normally meet the needs for airports strictly limited to the private-owner type of aircraft.

Private-owner types of aircraft which will utilize the airparks of tomorrow will be the smaller, low-powered variety almost exclusively. They should not be confused with the large, multi-engined transport type or high-powered military aircraft now in use, in considering the noise problem, or any fancied adverse effect of an airpark to a community. The problem of noise elimination is receiving careful consideration by the designers of all types of aircraft, but particularly is this true of the private-owner type. As aviation advances it will produce airplanes which are safer, more efficient, and quiet in operation, removing what grounds now exist for objections to airports and airplanes in residential communities. In fact the time is not far distant when the existence of an airpark in a residential neighborhood will be considered an asset. Several real estate developments have recently been centered around airpark developments with each residence lot having access to the landing field and space for a combination hangar-garage. An outstanding development of this nature is the Sierra Sky Park at Fresno.

Other communities are combining "Airparks" with recreational facilities, golf courses, tennis courts, picnic areas and the like to evolve community facilities meeting the needs of all of the residents. Examples of designs for facilities of this type are shown in the accompanying photographs.

Airports can be made attractive and inviting centers of community life and interest and the "Airpark" may soon become an important adjunct of each suburban area, thus hastening the time when the personal airplane will take its proper place in the field of transportation.

Intermediate (Safety) Fields

Airports of all the groups so far enumerated are located with primary reference to the convenience of a community. They must, of course, be so placed and so planned as to allow safe use, but after that fundamental requirement has been assured convenience becomes paramount. But there are to be considered also other groups, which are established solely as a contribution to the safety of air navigation, and for which convenience plays almost no part at all. They are the intermediate fields and safety fields strategically placed to meet the needs of a pilot finding himself forced to an early descent either by stress of weather or by threats of mechanical failure.

The characteristic example of that class is the intermediate field, now maintained by the Civil Aeronautics Administration, and before the Administration was

created, by the Bureau of Air Commerce, and before that by the Air Mail Service operated by the Post Office Department, with which the concept of such a field originated. Along the 36,000 miles of federally established lighted airways in the United States the intermediate fields are located at irregular intervals, but so placed that it is seldom that 50 miles intervene along any airway between marked and lighted landing places. Their number has tended to diminish in recent years because of the lessened liability of aircraft to forced landings, and especially because the need for some of them has disappeared as municipal airports have been established in the same regions; but there are still more than 250 intermediate fields under Federal control and maintenance, and they still play an important part in insuring airway safety. Though they are commonly known by the name of the town to which they are nearest, considerations both of economy and of policy have in general kept them well out into rural areas.

It has often been suggested that the idea of safety fields, available at reasonably short intervals along a line of flight ought not be limited to a comparatively few regular airways; but that such fields should be provided in all areas having no other airports, at close enough intervals to permit flight along a straight line between any origin and destination, with a safety or regular airport always within easy reach. Such a thesis is both extravagant and unwise in a state such as California where extremes of topography and vast rugged wilderness areas dictate detours, in the interest of safety, except for the larger multi-motored aircraft. As has been noted elsewhere, the established airways connecting major centers of population generally follow the more favorable terrain of natural valleys and passes and, with few exceptions, afford the most direct line of flight. There are however certain isolated mountain areas in California which are not on the airway system and which have a community of interest with major centers separated by terrain extremely unfavorable for emergency landings. Examples are Eureka, Alturas, Susanville, Lake Tahoe and Owens Valley points. But even here natural routes of surface and air travel exist which coincide with the general pattern of airports made necessary by the disposal of cities and towns. When the airport pattern for such cities and towns is complete there will exist very little if any need for additional purely "emergency" airports, although the "emergency" aspect may be an important consideration in justifying facilities in many remote mountain communities.

Airports for Helicopters

An essential characteristic of this comparatively new aircraft type is a reduction of the ground space required for landing and taking off. The helicopter, which has as yet had little commercial acceptance but is now showing distinct promise, is able to rise and

descend vertically, and therefore needs an "airport" very little exceeding in area, the space that the machine occupies when it rests on the ground. They would find more than ample room in any airport designed for the operation of an airplane; but in their special capacity lies the possibility of adding smaller fields for rotor aircraft alone, fields which because of their more restricted size may be placed nearer the center of a community than land values would permit with a normal airport. Projects are periodically launched for building operating platforms for such aircraft as these over high buildings, or even for utilizing flat roofs directly. For a limited amount of operation in the hands of highly skilled pilots, such sites are practicable even now; but a better prospect for general use would seem to lie in an open field, of perhaps one-tenth the dimensions that a transport airplane may need. It is not premature to plan such sites at the present time, since successful experiments have been conducted recently in Los Angeles and other metropolitan areas wherein helicopters have been employed for local pickup and delivery of airmail between outlying cities and the central post office and air transport terminals. The experiment proved so successful and time-saving that bids have been requested by the United States Post Office Department to establish the service on a permanent basis.

Seaplane Bases

Finally there is the problem of the seaplane. Strictly speaking, a seaplane base is covered by the definition of an airport; but in this report, the word airport has been used for convenience to describe bases for land planes alone. Airports thus narrowly defined and seaplane bases should however be considered together, for they have essentially the same purpose; and the legislation directing the making of the National Airport Plan has been understood to apply to airports in the broad sense, and thus to include the provisions for water-based aircraft.

However, recent tendencies in aircraft design have inclined toward the development of amphibious aircraft, able to utilize either water or land. Such seaplane base sites as now exist in California will probably continue to be available for future development and will serve meanwhile in their natural state until the volume of seaplane or amphibious traffic warrants further treatment. Hence, there is not the urgency in this phase of development that is found in the airport problem, for which reason this report does not concern itself with water landing areas, particularly since requirements in this direction are virtually an unknown quantity.

7. THE STATE MASTER PLAN OF AIRPORTS

Legal Background

California had no State aviation agency or legal body specifically charged with the development of aviation or a system of airports within the State. Its State Reconstruction and Reemployment Commission is, however, charged, among other duties, by the law which created it, with "all the duties, powers, purposes, responsibilities and jurisdiction of the State Planning Board" which it specifically succeeds. Such duties include the fostering and state-wide coordinating of regional planning in several important fields, among them Transportation. Under this heading, Regional and State-wide Master Plans are required to show a "comprehensive transportation system—including port, harbor, aviation and related facilities."

The Commission is further charged by law "to endeavor to promote plans and programs—to encourage the development of industry and a regional economy—and to cooperate with Federal, State and other public and private agencies to effect the purposes of this Act." Ample authority, therefore, exists for the interest of the State Reconstruction and Reemployment Commission in the development of State and Local airport master plans.

The California Planning Act further provides for the creation, by ordinance in each city and county within the State, of planning commissions whose duties are as outlined above and include the "preparation of comprehensive, long-term general plans for the physical development"—of the communities which they serve, with reference to transportation (and aviation) as indicated.

This, then, is the legal background of this first attempt to provide, under State sponsorship and guidance, a Master Plan of Airports for the State of California.

Outline of Purposes

From its inception the program culminating in this report was intended to provide the stimulus, guidance and supervision necessary to develop in each local planning jurisdiction, a master plan of airports truly representative of local needs or future requirements and designed to conform to the requirements of the Federal Airport Program. It was hoped that the plans thus produced could be assembled and integrated into a State-wide plan representative of the best local thinking and efforts. It was an attempt to follow the precepts of the State Planning Act as expressed by the Honorable Earl Warren, Governor of California, at the inception of the program:

"It was the intent * * * that the State Planning Agency should devote itself primarily to

the task of helping all individuals and groups in the State concerned with post-war problems to help themselves * * *. No super-imposed planning agency of government can ever take the place of individual and community effort."

It was generally agreed that aviation and airport planning stand where the automobile industry and highway planning stood in 1910. In retrospect no one will deny the advantages which would have accrued had we planned our present highway requirements, urban and State-wide in 1910, nor will they now deny the need for planning the highways of the future. Similarly, the need for vigorous, far-sighted planning of aviation facilities and the integration of such facilities into the community plans of the future is upon us now. Aviation can only grow and serve humanity as we adapt it fully to our transportation needs.

In furtherance of this concept it was declared to be the State's purpose to:

(1) Encourage city, county and regional airport planning and the integration of airports into community master plans.

(2) Establish standards of adequate airport plans, and provide the uniformity necessary to make local plans readily assimilable into a State plan.

(3) Provide fundamental data to assist local planning agencies in estimating population growth, future aviation growth and consequent airport needs.

(4) Serve as a clearing house for information relative to airport planning, airport standards and regulations relating to the Federal Airport Program.

(5) Assist each community planning agency to make its airport plan an acceptable part of a larger plan representing the composite needs of the State.

Community Lethargy

That this conception of cooperation between State and local governments is desirable would appear to be axiomatic. Yet for many reasons it has not produced the desired results. The several communities of the State and Nation are not equally interested in aviation, nor concerned with planning for its future as is evidenced by the present spotty development of aviation facilities. Nor are all communities financially able to participate in an airport development program. To many local governmental bodies aviation is still a thing apart despite its phenomenal growth of the past decade as pointed out in an earlier section. In short the need for planning of aviation facilities has been received in varying lights, ranging from eager cooperation to complete lethargy by communities. Exactly one-half of the counties of California have accepted the challenge to action.

Selection of Aviation Areas

In treating the aeronautical needs of the State as a whole it has been considered advisable to delineate fourteen areas in each of which the acceptance of aviation, the problems of commerce and industry or the physical geography of the State has indicated a community of interest. Each of these areas includes one or more metropolitan centers around which the community life ebbs and flows. With two exceptions, each contains one or more important air carrier terminal cities and embraces the region which supplies passengers, mail, express and air-freight to support those airline stations. Several coincide with the Metropolitan Areas delineated by the Civil Aeronautics Administration, wherein airport requirements of the whole area must be planned prior to participation in the Federal Airport Program. Each includes one or more counties and is bounded by county lines with the single exception of the Los Angeles Metropolitan Area (#2) which includes the coastal portions of Riverside and San Bernardino Counties contiguous to Los Angeles County. As stated above, they conform to the topography of the State coinciding with the natural subdivisions which terrain and climate dictate, and which in turn provide a variety of problems in estimating airport requirements. The wide range in population density in the several sections of the State affords an excellent indication of the need for area treatment. Diversity of resources, agriculture, industry and occupation, as pointed out in Part III hereof, further dictate individual approach to the problems under consideration in this report.

The accompanying map, Plate B, indicates the areas selected, the counties and principal cities in each, and the numerical designation under which all factors and deductions affecting the area will be treated throughout this report. A close study of the map is therefore basic to an understanding of all that follows.

Treatment by Aviation Areas in Appendices

The fourteen Aviation Areas selected and illustrated might logically be designated Airport Districts wherein airport planning and development might properly be conducted by a single agency responsible for supplying adequate aeronautical facilities in an economical manner upon a broader base than is now possible under individual community effort.

Since each airport exerts an influence which may extend beyond the borders of the city or county which provides the facility it is logical to consider their interrelationship until a natural boundary or barrier is encountered which separates one group from its neighbors. Accordingly each area has been given similar treatment in Appendices 1 to 14, and the results of such treatment have been carried forward into the conclusions reached in Part VI.

Method of Resolving Conclusions

Since the purposes to be achieved by this report, as stated in the Foreword, are to project the needs of civil aviation to the years 1950 and 1955, and to specify in terms of general location only the development necessary to anticipate and meet those needs, every effort has been made to appraise existing facilities in terms of their adequacy and to suggest the improvements required or the new facilities needed during the life of this program. For this purpose it has been assumed that certain existing facilities, whether public or private, can be protected and perpetuated and, in the absence of positive knowledge to the contrary, expanded as indicated to meet the needs of the future. Upon this basis other existing airports improperly located, incapable of expansion or purely private in nature are not relied upon to provide for future needs.

Accordingly, the conclusions reached herein relate specifically to certain existing airports and provide for new facilities in other instances, with apparent disregard for those now in existence. However, all factors have been considered in arriving at the most logical recommendation.

Airport development has been justified in each case on one or more of the following bases, applicable to the particular community under consideration.

Airline—Existing	Code AE
Airline—Projected	Code AP
Feederline—Existing	Code FE
Feederline—Projected	Code FP
Cargo—Projected	Code C
Recreational	Code R
Forest Services	Code FS
Non-scheduled and Private	Code NS

As a basis for establishing the service area of each airport, it has been assumed that airports for non-scheduled aviation in less populous areas serve a fifteen (15) mile radius, while in metropolitan regions, their service area is limited by the capacities for various classes of airports outlined elsewhere in this report. The service area for air transport or feeder line airports has been assumed to be twenty-five miles in the more populous centers extending upward somewhat where population is particularly sparse. (For example, a feederline serving an isolated community 75 or 100 miles distant from another similar or larger community might be expected to attract and serve patrons over a 40 or 50 mile radius.)

Upon these bases each community in California has been considered with respect to the needs of scheduled and non-scheduled aviation as indicated by the projections established in Part V hereof. The conclusions reached are believed to present a fair and equitable statement of the airport requirements of the State through the life of the Federal Airport Program. The years at which certain improvements or new construction are indicated provide a basis of priority for the various projects recommended.

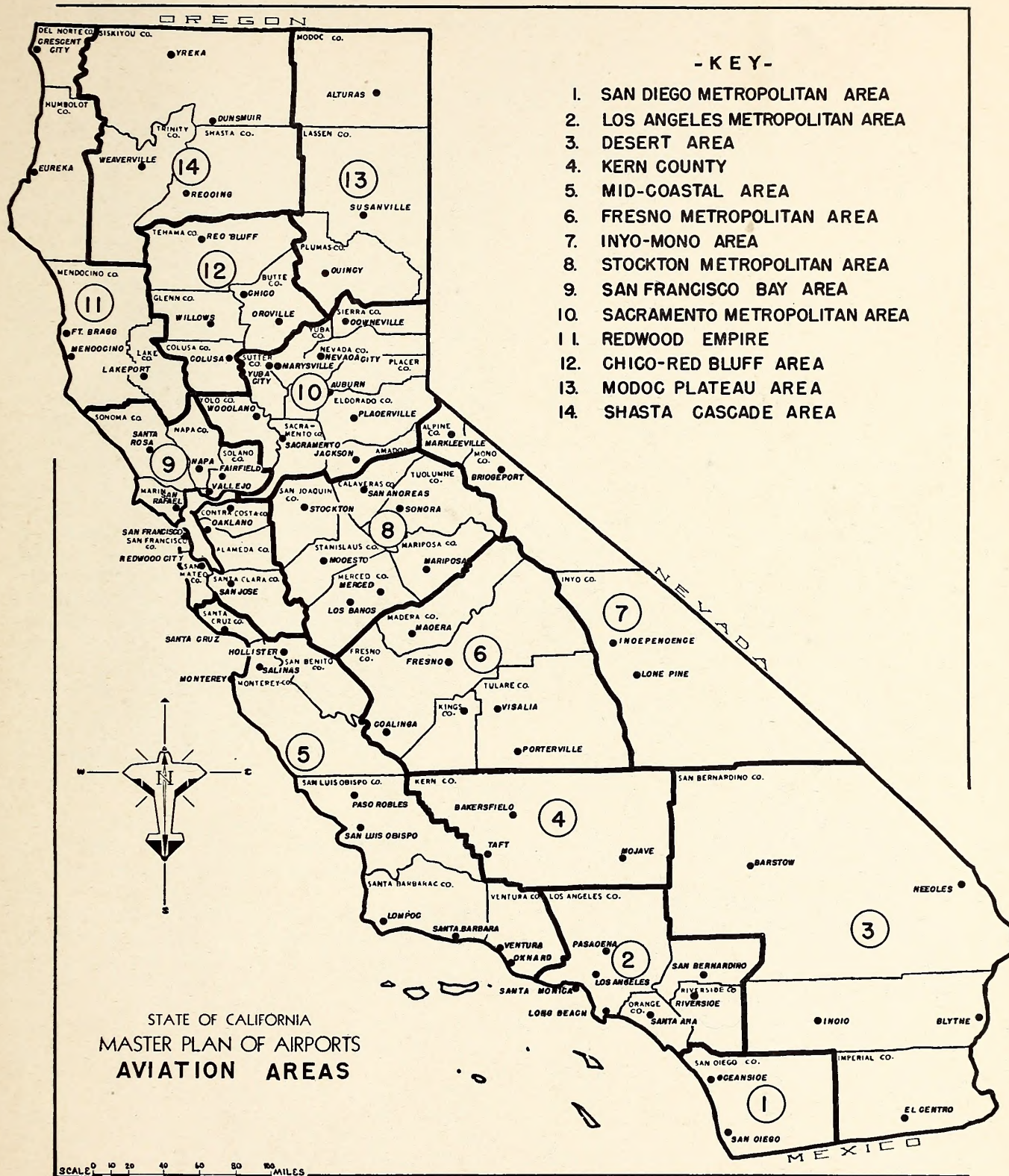


PLATE B



PART II — PHYSICAL CHARACTERISTICS OF CALIFORNIA

1. CALIFORNIA — THE STATE

In sheer bulk, the State of California is impressive. With a length of approximately 800 miles and an average width of 200 miles, covering over 100,000,000 acres, it is the second largest State in the Union. Within this area of 156,803 square miles of land, there exists nearly every combination and every contrasting extreme of topography, climate, soil, and mineral plant and animal life which can be found in the United States, as well as some which are unique to this State. Within the State's borders are examples of practically every known landscape feature. California is larger in area, and has a greater diversity of natural economic resources, than some of the principal European nations. Its land area is larger than the British Isles.

This diversity of conditions makes difficult any general description of the State. There are great differences between various regions and localities. Economic activities are extremely diversified. The characteristics and the primary interests of one locality may be entirely different from those in another. Too, like every other State, California has certain distinctive over-all characteristics which have important direct or indirect influences on aviation. Its far distances and "wide open spaces" between cities and its geographic location in the nation contribute greatly to an interest in and demand for air transportation—passenger, mail and freight; its climate and varied scenic beauty create an interest and demand for facilities for recreational and avocational aviation.

Transposed to comparable latitudes along the Atlantic Coast, California's shore line would extend from about Boston, Massachusetts, to Charleston, South Carolina. This State's western border constitutes three-fifths of the Pacific Coast line of continental United States, extending from the border of Mexico nearly a thousand miles northward along the shores of the Pacific Ocean. The three ocean gateways, San Francisco, Los Angeles and San Diego are closer to Hawaii, Australia and New Zealand than any other port in the United States. Inevitably, California is the destination of much of the continental air traffic. Inevitably, it intercepts most of the traffic bound for nations bordering the Pacific. Located in the extreme southwestern corner of the United States, California is a major terminal for transeontinental, coastwise, transPacific and Latin American trade routes.

California's position is significant in national defense. With over 900 miles of shore line and a 140-mile Mexican border, it is extremely vulnerable. Its naval air base at San Diego completes the North Pacific coverage partially furnished by Pearl Harbor, Sitka, Seattle and Coco Solo, Canal Zone. The physical extremity of its position in the United States intensifies the need for maintenance and preservation of defense precautions.

All of these factors must be understood and evaluated as background for a State Master Plan of Airports.

2. TOPOGRAPHY

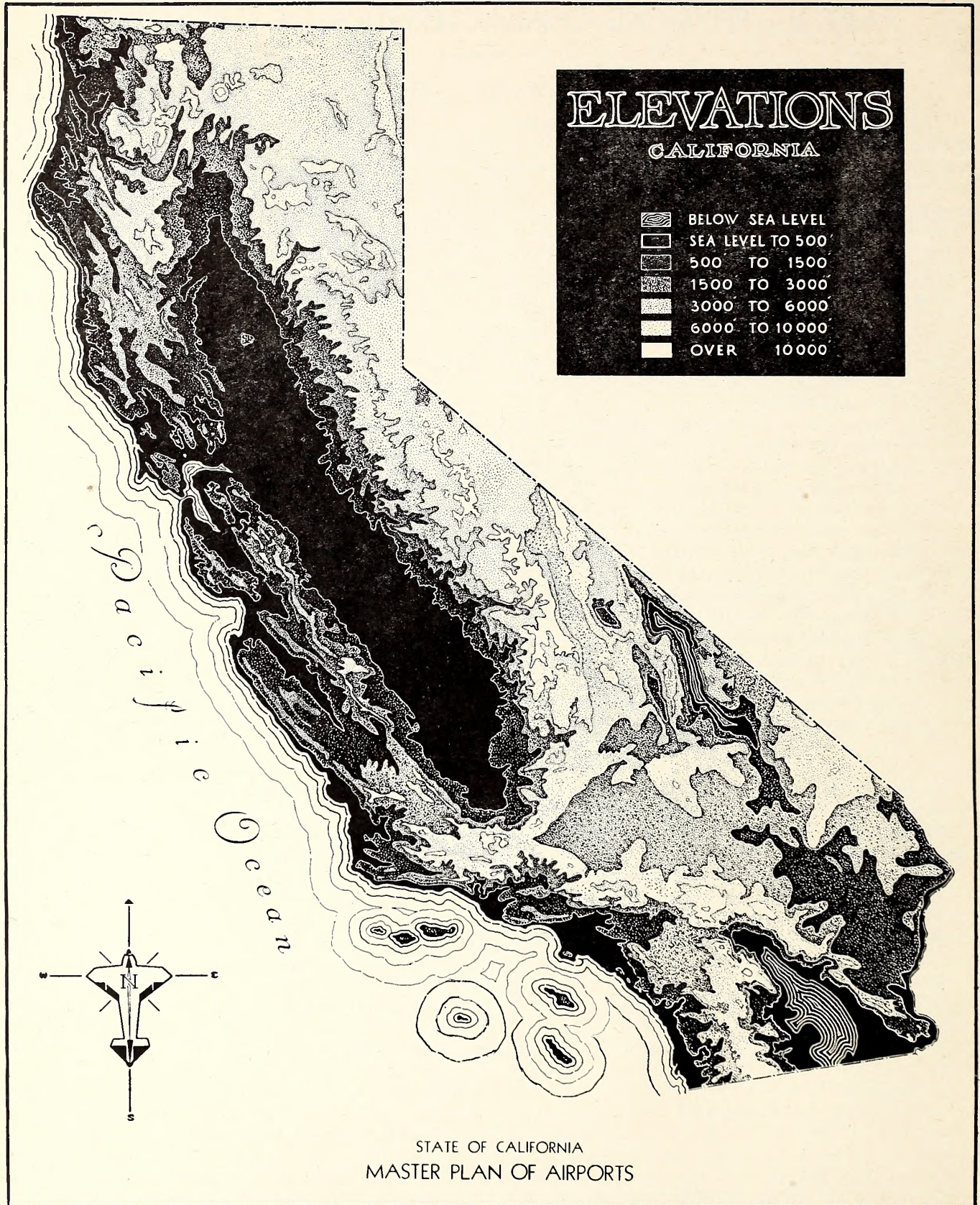
In California, topography is a prime factor in the consideration of any phase of transportation facilities and requirements, as is best illustrated by reference to Plate A in the Introduction.

Topography contributes notably to the recreational resources of the State. In addition to providing the general setting and background for human activities, it largely controls the nature and distribution of both climatic types and natural vegetation. Directly or indirectly the pattern of mountain, valley and ocean accounts for most of the variety that makes California a popular playground.

Three-fourths of the area of California is in rolling hills, foot-hills and rugged mountain areas; ranging in elevation from 500 feet to over 14,000—Mount Whitney, the highest peak in the United States, reaching an elevation of 14,496 feet. Mountains are in sight from almost every point in the State. Abrupt changes in elevation within short distances are common. Backbone of the State is the mighty Sierra Nevada range, having

more than a score of peaks over 10,000 feet in elevation, which extend for 400 miles along the eastern border. Great canyons, including King's River Canyon, Feather River Canyon, Yosemite and others, pierce its relatively gentle western slope; most of the eastern front rises abruptly above the desert, where Death Valley—276 feet below sea level, the lowest (and the hottest) point in the United States is located. Other important mountains are the comparatively low Coast Range, the San Gabriel and San Bernardino Mountains north of Los Angeles, and the Peninsular Range just inland from San Diego.

All serve as vast natural parks for adjacent metropolitan centers. The rough and rugged mountain areas have many functions to perform which contribute to the enrichment of the State. They contain great forest areas, fish and game, scenic and recreational resources, and livestock grazing, constituting a natural requirement for the advantage of aviation communication and transportation. These are the great watershed areas



which store the rain and snow and replenish the water supplies so important to California.

Between and through these mountains are passes which have been used by oxcart, railroad and automobile. Airplanes can cut across even the High Sierras, but most air lines follow in a general way the lower, safer routes afforded by passes.

Vast expanses of rough country interfere with a uniform distribution of fields, and there are wide areas without even emergency landing facilities. Furthermore, the decreased density of air at high elevations means that planes must land and take off at higher speeds, and climb at flatter angles. Aircraft requiring 2,500-foot runways at sea level must have 3,000 feet at elevation of 2,000; 3,750 feet at elevation 5,000; and 5,000 feet at elevation 10,000. Adequate landing areas for the larger transport planes are therefore practically nonexistent in mountain regions. For this reason careful study and planning is necessary to determine the requirements for fields adjacent to these areas providing the greatest possible degree of accessibility.

About one-fourth of the land area of California is level. Most of these valley lands are between sea level and 500 feet in elevation. They comprise the principal agricultural areas of the State. The warm belts—most characteristic of California, and where most of her people live—two-thirds of the population of the State

have settled in coastal counties—are below the 2,000 foot elevation. The principal lowland of California is the long, flat Central Valley between the Sierra Nevada and the Coast Range. Of greater interest from the scenic point of view, however, are the Owens Valley, Death Valley and hundreds of delightful little valleys scattered throughout the mountain areas.

On the west is the broad Pacific Ocean. Along the shore, in the mountains, there is a wide assortment of recreational resources. The intersection of land and sea has produced innumerable crescents of smooth beach, rocky headlands, land-locked bays and tidal lagoons, all of which invite one for pleasure and recreation. The general attractiveness of the shore line province has played a large part in shaping the pattern of population centralization.

Bays, rivers and lakes large enough for seaplanes and amphibians are few in number and far apart. Humboldt Bay, San Francisco Bay, Los Angeles Harbor and San Diego Bay are the only coastal points with large bodies of protected water. Except for the lower, tidal portions of the Sacramento and San Joaquin Rivers, no California streams could accommodate seaplanes. There are only a few large, fresh-water lakes. Any extensive development of seaplane and amphibian flying clearly would depend on the expenditure of substantial sums for artificial bases.

3. CLIMATE

California has not one climate, but rather six climatic zones. This is more readily understood upon realization of the fact that, if laid across the continent of Europe, the State would reach from Norway to Italy, and further, that elevations range from below sea level to over 14,000 feet, the lowest and highest points in the United States being located within its boundaries.

Rainfall is a vital climatic factor in California. Annual average rainfall varies from over 100 inches in the northwest corner of the State to three inches or less in the southeast corner. In most of the highly developed agricultural sections of the State, rainfall varies from 5 to 30 inches annually, but it is largely concentrated in the winter months from November to March. Consequently, supplemental irrigation during the summer months is necessary for most fruit and vegetable crops.

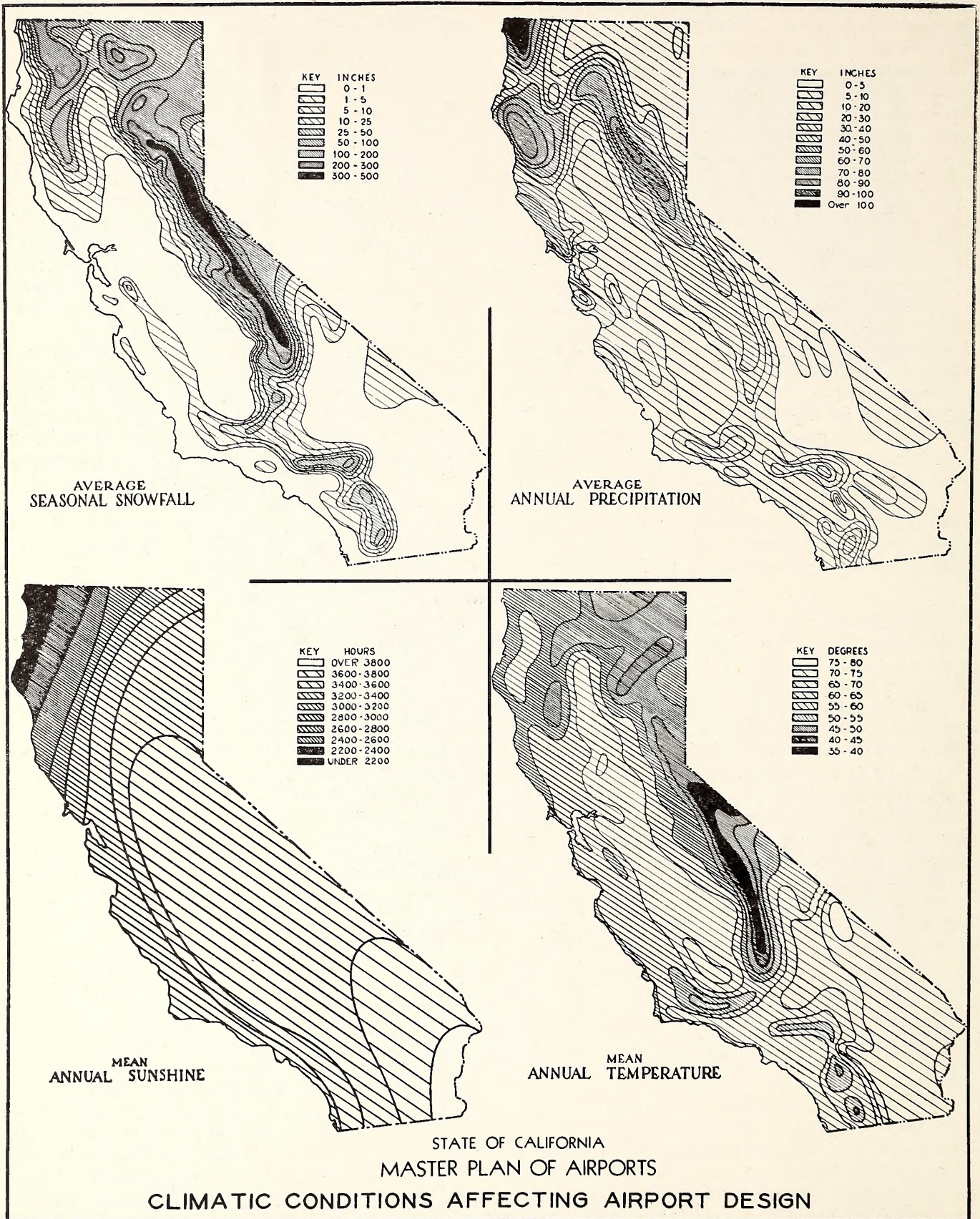
Dividing the State generally into characteristic climatic regions, the north coast area, from Del Norte County to Marin County, is a region of heavy rainfall, cooled by summer fogs along the coast, and with no extreme variations in temperature. This is the redwood region.

The mountain counties above the 2,000 foot elevation, north and east of the great central valleys of Sacramento and San Joaquin, have another type of climate, with heavy winter snows in the higher altitudes of the Sierra Nevada Mountain Range; the Sierra Nevada has the heaviest snowfall in the United States

and is most popular for winter sports in certain accessible spots during periods of severe winter storms. Here there is moderate to heavy rainfall, little or no fog, and greater extremes in temperature. This is also the only area in the State in which winter freezing and thawing must be taken into account in airport design.

The central valleys have hot, dry summers. During the winter the average rainfall varies from 24 inches in the northern end of the Sacramento Valley to six inches in the southern end of the San Joaquin Valley. Summer temperatures are higher, and winter temperatures are lower, than along the coast. The monthly averages of daily extreme temperatures in August range from 57 minimum to 87 maximum in Sacramento and Stockton, and from 62 minimum to 98 maximum in the southern San Joaquin Valley. Vast desert areas in the southeast blister under the summer sun and are warm even in winter. In recent years an increased appreciation of the beneficial effects of the sunlight has led to the development of Palm Springs and other desert recreation communities.

Around the San Francisco Bay, and along the coast southward to Pismo Beach and Point Conception, is another zone, some 10 to 30 miles wide, where climate is determined by the varying extent to which ocean breezes and ocean fogs are admitted or cut off by valleys and mountains of the Coast Range. In general, it may be characterized as equable, with relatively cool summers and warm winters.



From Santa Barbara along the Southern California Coast to San Diego, both summer and winter climate is somewhat warmer, as are ocean currents. The coastal lowlands between Santa Barbara and San Diego have the sub-tropical climate most people associate with California. Here mild, almost frost-free winters are warm; dry summers, tempered by cool ocean breezes are characteristic. As a result, outdoor recreation in many forms is possible throughout the year. This zone has a climate similar to the San Francisco Bay zone, but here the climate is somewhat warmer, with less rain and fog. As a rule, temperatures increase as one goes south or goes inland. At Santa Barbara, on the ocean's shore, monthly averages of daily extremes in temperature during August range from 57 to 77 degrees; at Los Angeles, about 15 miles inland, they range from 60 to 82; and at Riverside, some 35 miles from the seashore, they range from 56 to 93. Average annual rainfall in this region ranges from 10 to 18 inches. The peculiarities of climate in the southern part of the State are such that anyone seeking unique experience can ski in the mountains during the morning, and the same afternoon enjoy a swim in the ocean some sixty miles distant.

Back of this Southern California coastal plain rise high mountains, snow-covered in the winter. To the east of these mountain ranges is the Mojave Desert, and the reclaimed desert valleys of Coachella and Imperial.

This is another distinct climatic zone, with higher summer temperatures and little or no rain.

Therefore, it becomes evident that climate is a major basis for the amazing development of outdoor recreation in California. The State has become an year-round playground and mecca for tourists, largely because of its varied, but generally agreeable weather and climatic conditions.

With the exception of the extreme northern portion, the California coast has almost ideal flying weather. Skies are clear during most of the summer, fog is infrequent, winter rains are of short duration, snow and ice are virtually unknown, and winds are of relatively low velocity. Aside from occasional low "tule fogs," conditions throughout the central valleys are equally good. Most of the southeastern desert part of the State has good aviation weather. Desert heat results in lower air pressure,—longer runways, therefore, are needed. The North Coast with its rainy, foggy climate and the higher mountains with rain, thunder-storms and heavy snow during the winter are less well suited for safe-year-round flying. Even there, however, conditions are no worse than those typical of many other parts of the United States. Speaking generally, the climate and weather of California ranges from excellent to average for aviation purposes.

TABLE 14
CLIMATIC DATA—CALIFORNIA

Area Number County	Station	Station Elevation, Feet	Average Rainfall, Inches	Temperatures—Degrees F.—Monthly Averages of Daily Extremes			
				January		July	
				Low	High	Low	High
Area 1—San Diego							
San Diego	Escondido	750	16	36	65	55	89
	San Diego	87	10	47	62	62	72
Area 2—Los Angeles Metropolitan							
Los Angeles	Pomona	870	18	35	64	55	91
	Long Beach	50	10	42	65	60	80
	Los Angeles	338	15	46	65	60	81
	Santa Ana	133	12	39	67	58	84
	Riverside	851	11	38	66	57	94
	San Bernardino	1,054	16	37	67	57	96
Area 3—Desert							
Imperial	Calexico	0	3	39	68	76	104
Riverside							
San Bernardino							
Area 4—Kern							
Kern	Bakersfield	404	6	36	58	64	100
Area 5							
Monterey	Salinas	45	14	39	60	52	71
San Benito	Hollister	284	13	36	58	50	80
San Luis Obispo	San Luis Obispo	300	21	42	63	52	77
Santa Barbara	Santa Barbara	130	18	43	64	56	76
Santa Cruz	Santa Cruz	20	27	38	61	49	75
Ventura	Ojai	900	21	35	66	53	92

CALIFORNIA AIRPORTS

TABLE 14—Continued
CLIMATIC DATA—CALIFORNIA

Area Number County	Station	Station Elevation, Feet	Average Rainfall, Inches	Temperatures—Degrees F.—Monthly Averages of Daily Extremes			
				January		July	
				Low	High	Low	High
Area 6							
Fresno	Fresno	327	9	38	54	65	99
Kings	Hanford	249	8	35	56	61	99
Madera	Madera	296	9	35	54	58	98
Tulare	Porterville	464	10	36	58	63	100
Area 7							
Alpine							
Inyo	Independence	3,957	5	27	52	63	94
Mono							
Area 8							
Calaveras							
Mariposa	Yosemite	3,983	33	22	46	49	90
	Mokelumne Hill	1,400	31	37	53	62	92
Merced	Merced	173	11	36	55	61	97
San Joaquin	Stockton	20	14	37	53	58	89
Stanislaus	Newman	91	10	36	56	59	97
Tuolumne	Sonora	1,825	33	35	54	61	93
Area 9—San Francisco Metropolitan							
Alameda	Oakland	322	23	42	54	55	72
Contra Costa	Antioch	46	12	38	54	58	91
Marin	Kentfield	65	46	37	54	48	83
Napa	Napa	20	23	38	55	52	80
San Francisco	San Francisco	155	22	45	55	53	65
San Mateo							
Santa Clara	San Jose	141	15	38	57	53	80
Solano	Vacaville	175	26	36	56	54	94
Sonoma	Santa Rosa	167	30	36	56	49	82
Area 10							
Amador							
El Dorado	Placerville	1,925	41	31	51	52	92
Nevada	Grass Valley	2,690	51	34	52	62	89
	Truckee	5,819	26	16	38	43	81
Placer	Auburn	1,360	33	36	54	61	93
Sacramento	Sacramento	69	19	39	52	58	89
Sierra							
Sutter							
Yolo	Davis	51	17	36	53	53	96
Yuba	Marysville	67	20	37	54	60	96
Area 11							
Del Norte							
Humboldt	Eureka	62	39	41	53	52	60
Lake	Upper Lake	1,343	28	33	54	54	93
Mendocino	Ukiah	650	36	35	55	50	94
Area 12							
Butte	Chico	189	24	36	54	44	73
Colusa	Colusa	60	16	38	53	60	94
Glenn	Willows	136	16	36	53	61	97
Tehama	Red Bluff	342	24	38	53	66	97
Area 13							
Lassen	Susanville	4,271	20	21	40	51	87
Modoc	Alturas	4,446	13	15	40	45	89
Plumas	Quincy	3,409	40	23	46	44	87
Area 14							
Shasta	Redding	590	37	37	54	67	97
Siskiyou	Yreka	2,625	17	24	44	52	92
Trinity							

Source: California State Chamber of Commerce—Research Department Economic Survey Series 1940-41, Report No. 3 From Weather Bureau, United States Department of Agriculture.

4. LAND USE

California has a land area of 100,353,920 acres, or 156,803 square miles, and an inland water area of 1,959 square miles, a total land and water area of 158,762 square miles. Following is a table showing distribution of Land by Types of Ownership:

	<i>Acres</i>	<i>Percent</i>
Privately owned rural area-----	50,456,346	50.3
State Land ownership-----	1,224,760	1.2
Federal Land ownership-----	41,961,647	41.7
Ownership unknown -----	6,711,167	6.8
Total Land area-----	100,353,920	100.

Land use distribution of the State, by million acres and percent, is shown in the following tabulation. The same figure expresses both millions of acres and percent because the total land area of California is approximately 100 million acres.

<i>Major classes of land</i>	<i>Million acres and percent</i>
Timber cropland -----	18
Other forest land-----	28
Pasture and range land-----	17
Agricultural cropland -----	13
Desert area -----	24
	100

Luxuriant forests of pine, fir and other evergreen species cover the northwestern quarter of California, and extend southward in gradually diminishing belts throughout all the higher mountains. Most impressive members of this forest family are the giant redwoods, found nowhere else in the world. The Sequoia Gigantea, growing in scattered groves along the central part of the Sierra Nevada, are the oldest living things on earth. Their somewhat smaller cousins, the Sequoia Sempervirens, occur in solid stands along the moist north coast, and in scattered groves halfway to Los Angeles. The forests generally and the precious redwood groves in particular serve many recreation interests.

Following is a tabulation showing the major vegetation types in the State by million acres and percent:

<i>Major vegetation type</i>	<i>Million acres and percent</i>
Timber forest -----	18
Other conifer forest-----	6
Woodland (Hardwoods) -----	10
Chaparral -----	10
Sagebrush -----	7
Grass -----	10
Desert -----	24
Cultivated urban and industrial-----	14
Barren -----	1
All types -----	100

About one-half of the land area of California, or 49,897,574 acres, is publicly owned, of which 23,822,359 acres is in National Forests and National Parks and Monuments.

National Forests are established to protect and maintain, in a permanently productive and useful con-

dition, land not suited to farming but capable of growing timber, regulating the flow of streams, and producing forage for livestock. Commercial enterprises, such as the cutting of timber, the development of irrigation and water power, and the grazing of livestock, are permitted within the forests, as long as they are not harmful to the continuous production of these resources, under the "multiple use" policy. They are likewise used for camping, fishing and winter sports.

California has 18 National Forests, including about one-fifth of the area of the State. About one-half of the merchantable pine and fir timber of the State is in these forests.

Over most of the Coast Range and the lower slopes of high mountains in the central and southern parts of the State, lies an olive green brush cover, the chaparral. This, too, is a forest of diminutive scale, full of richness and color, useful in the conservation of water and moisture, the habitat of many types of birds and animals.

The show spots of the State at certain seasons, however, are areas of the thinnest cover. The flat pasture lands and gentle grassy slopes are, in fact, California's most brilliant natural gardens. In the spring, thousands of acres are carpeted entirely with yellow poppies and blue lupines, with vast neighboring areas covered by smaller but equally colorful annuals and perennials. These truly gorgeous flower shows provide uplift and refreshment for thousands of visitors. However, due to increased land cultivation in the State, these wild flower gardens are rapidly diminishing in extent, having decreased in the past decade from approximately 200,000 acres to less than 50,000 acres, the wildflowers disappearing to a great measure as the land is placed under cultivation.

The desert, although seemingly barren, has its own peculiar vegetation. Forbidding but colorful cactus, weird trees and shrubs and startling groves of palms constitute its basic attraction. After favorable winter rains, however, the desert blooms with color. City dwellers and visitors in great numbers find pleasure and recreation in its far-flung carpet of verbenas and other vividly colored flowers.

Open lands are principally desert and brush covered lands of little commercial value, including the remaining public domain which is no longer open for homestead entry. Of the 50,456,346 acres of land in private ownership, some 30,524,324 acres are within the boundaries of farms; and 19,932,022 acres are in other private ownership, about half of which is forest land and half other classes of land.

About one-fourth of the land area of California is level. Most of this valley land is between sea level and 500 feet in elevation and comprises the principal agricultural area of the State. As is clearly shown on the accompanying land use map, the large core of the

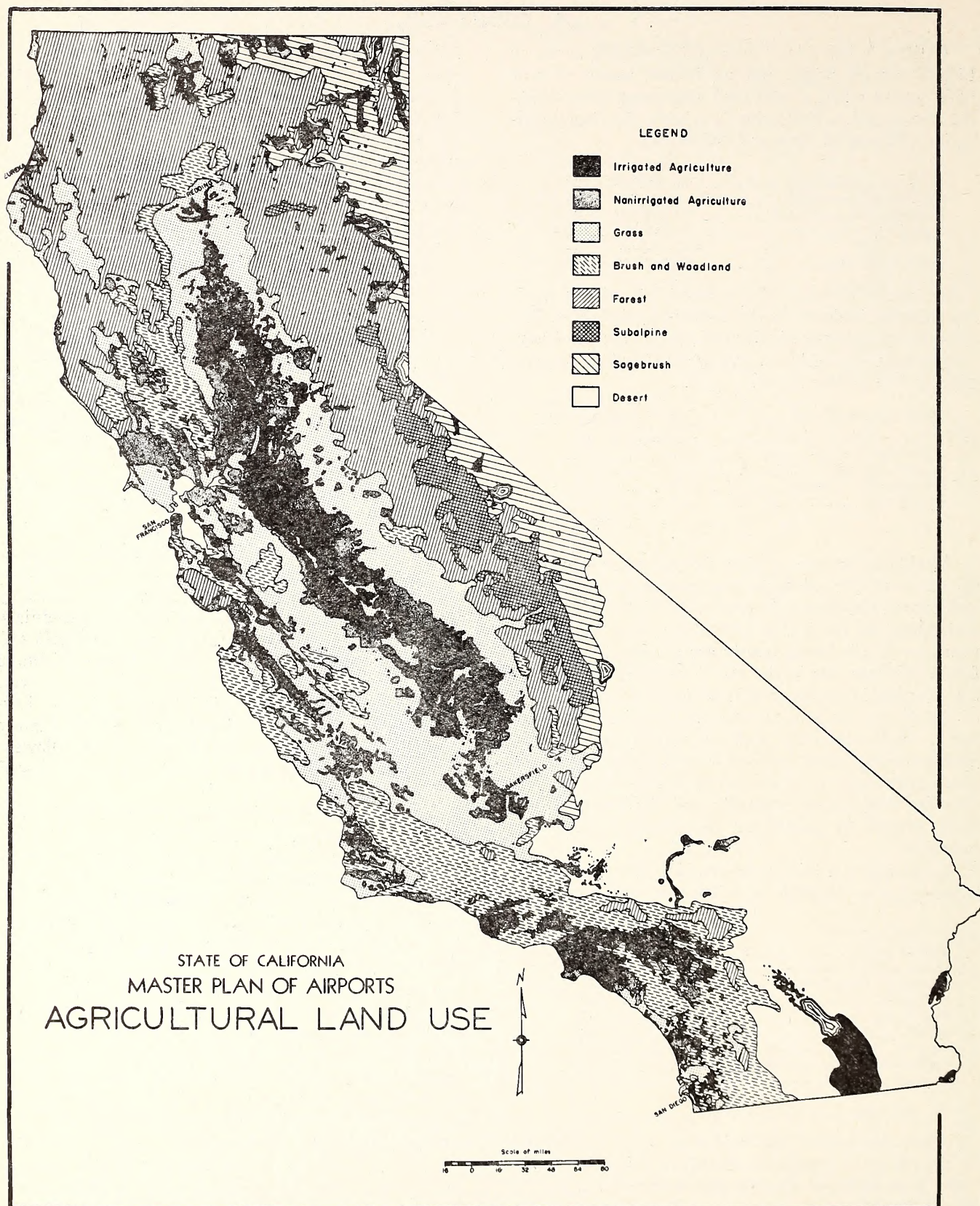


PLATE E

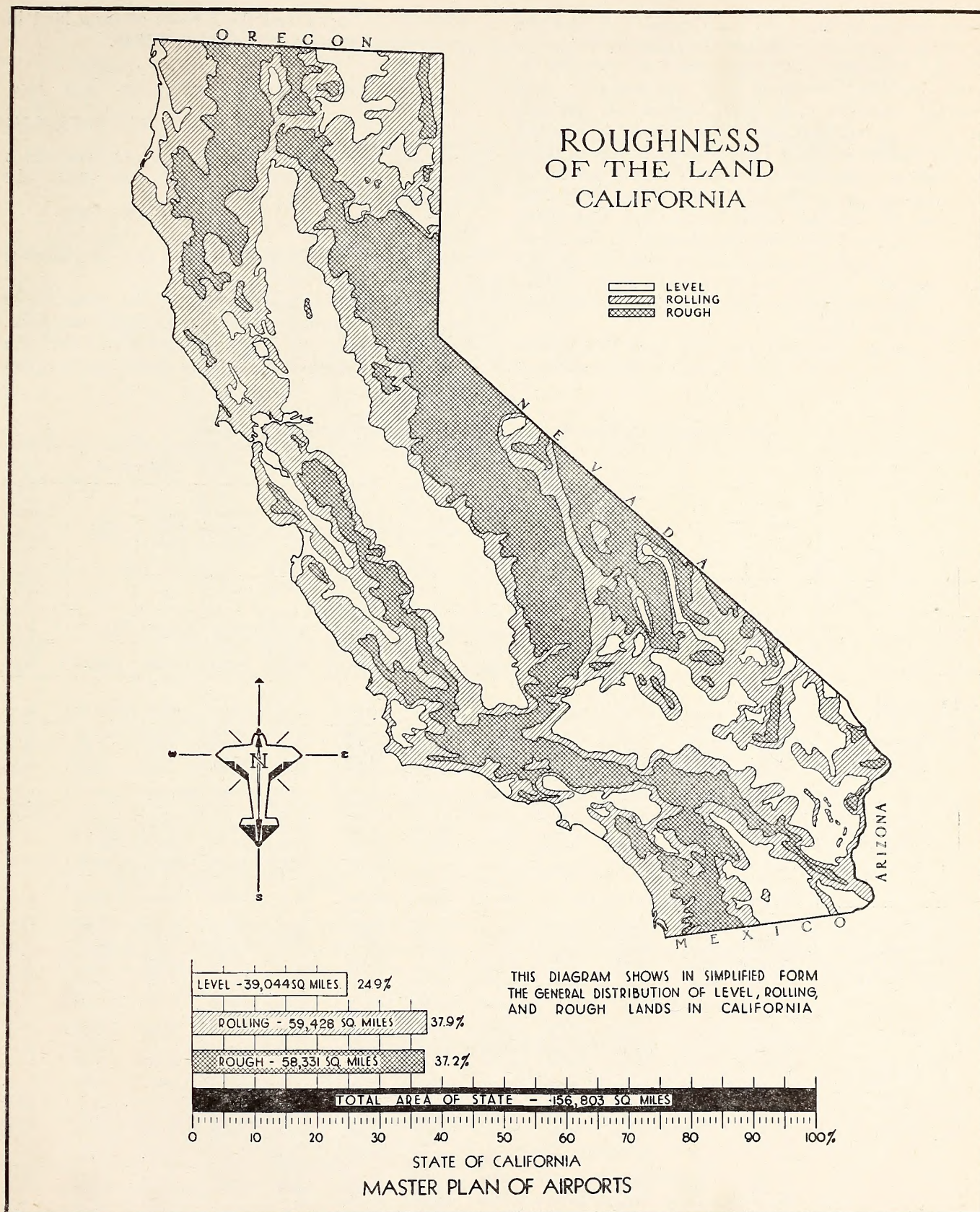


PLATE F

State formed by the California Central Valleys, from Redding to just south of Bakersfield, contains the greatest part of the State's 30 percent of combined agricultural cropland, irrigated and non-irrigated, and pasture, grass and range land. Agricultural cropland areas in the northern part of the State outside the valley confines are small and scattered. However, there is a second important agricultural section located in the area adjacent to the coast south of San Francisco, through the rich and fertile Santa Clara and Santa Maria Valleys. This section extends south to San Diego along the southwest coast and inland to the desert, with an important agricultural area south of the Salton Sea in Imperial Valley—here irrigation has literally made the desert bloom.

Following is a comparative table from 1910 to 1940 showing the extent of California land in farms and land

available for crops, and the acreage of farm land in pasture for the years 1925, 1930 and 1935.

THOUSANDS OF ACRES							
	1900	1910	1920	1925	1930	1935	1940
Land in farms ---	28,829	27,931	29,366	27,517	30,442	30,438	30,524
Land available for crops -	11,959	11,390	11,878	11,434	11,465	11,631	12,905
Percent ----	41.5	40.8	40.4	41.6	37.7	38.2	42.3
Acreage of farm land in pasture *				16,872	19,991	19,500	
Percent				61.3	65.7	64.2	

* Source—U. S. Census. Comparable figures were not obtained in the 1940 census.

Approximately three-fourths of the State's area consists of rolling hills, foothills and rugged mountains. This is the area containing California's forests. The great timber croplands and other forest lands encom-

TABLE 15
LAND USAGE IN CALIFORNIA BY AVIATION AREAS AND COUNTIES—1940

Area	Total Acres	Privately Owned							Publicly Owned			
		Farm				Other Private Land	Sub-total	Percent of Total Acres	National Forests and Parks	Other Public Lands	Sub-total	Percent of Total Acres
County		Land in Crops	Idle Cropland	Woodland, All Other	Farm-land, Total							
Column	1	2	3	4	5	6	7	8	9	10	11	12
California.....	100,353,920	6,830,953	6,064,021	17,629,350	30,524,324	19,932,022	50,456,346	50.28	23,822,359	26,075,215	49,897,574	49.72
Area 1. San Diego.....	2,725,120	113,471	130,950	705,044	949,465	479,321	1,428,786	52.43	271,534	1,024,800	1,296,334	47.57
Area 2—Los Angeles Metropolitan.....	4,577,920	638,940	254,260	745,275	1,638,475	1,531,858	3,170,333	69.25	916,626	490,961	1,407,587	30.75
Los Angeles.....	2,605,440	253,677	116,783	226,092	596,552	1,064,622	1,661,174	63.76	645,045	299,221	944,266	36.24
Orange.....	500,480	151,863	35,877	28,183	215,923	217,236	433,159	86.55	48,581	18,740	67,321	13.45
West Riverside*.....	896,000	133,400	66,600	200,000	400,000	200,000	600,000	66.96	148,000	148,000	296,000	33.04
S.W. S. Bernardino*.....	576,000	100,000	35,000	291,000	426,000	50,000	476,000	82.64	75,000	25,000	100,000	17.36
Area 3. Desert.....	18,748,160	364,976	165,351	411,028	941,355	3,582,378	4,523,733	24.13	1,372,384	12,852,043	14,224,427	75.87
Imperial.....	2,741,760	280,359	79,777	57,893	418,029	1,241,971	1,660,000	60.55	-----	1,081,760	1,081,760	39.45
Riverside*.....	3,698,560	63,825	79,591	91,326	234,742	706,986	941,728	25.46	706,177	2,050,655	2,756,832	74.54
San Bernardino*.....	12,307,840	20,792	5,983	261,809	288,584	1,633,421	1,922,005	15.62	666,207	9,719,628	10,385,835	84.38
Area 4. Kern.....	5,228,800	259,608	119,407	1,294,509	1,673,524	2,161,821	3,835,345	73.35	347,978	1,045,477	1,393,455	26.65
Area 5.....	8,375,680	807,402	645,216	3,407,900	4,860,518	927,084	5,787,602	69.10	1,705,513	882,565	2,588,078	30.90
Monterey.....	2,127,360	216,155	135,039	978,147	1,329,341	198,999	1,528,340	71.84	317,634	281,386	599,020	28.16
San Benito.....	893,440	68,523	66,310	563,223	698,056	35,038	733,094	82.05	8,881	151,465	160,346	17.95
San Luis Obispo.....	2,128,640	208,717	240,232	1,000,403	1,449,352	192,868	1,642,220	77.15	187,896	298,524	486,420	22.85
Santa Barbara.....	1,756,800	133,012	122,203	565,935	821,150	252,477	1,073,627	61.11	632,657	50,516	683,173	38.89
Santa Cruz.....	280,960	34,350	23,935	46,774	105,059	151,969	257,028	91.48	-----	23,932	23,932	8.52
Ventura.....	1,188,480	146,645	57,497	253,418	457,560	95,733	553,293	46.55	558,445	76,742	635,187	53.45
Area 6.....	9,198,720	1,252,949	967,050	1,732,050	3,952,049	1,333,352	5,285,401	57.46	3,180,133	733,186	3,913,319	42.54
Fresno.....	3,830,400	475,579	342,313	645,976	1,463,868	603,672	2,067,540	53.98	1,335,494	427,366	1,762,860	46.02
Kings.....	892,800	219,242	92,953	194,970	507,165	341,404	848,569	95.05	-----	44,231	44,231	4.95
Madera.....	1,374,720	163,312	244,420	102,502	510,234	369,166	879,400	63.97	473,619	21,701	495,320	36.03
Tulare.....	3,100,800	394,816	287,364	788,602	1,470,782	19,110	1,489,892	48.05	1,371,020	239,888	1,610,908	51.95
Area 7.....	8,869,760	15,278	52,634	183,413	251,460	632,225	883,685	9.96	4,129,801	3,856,274	7,986,075	90.04
Alpine.....	462,720	1,317	(A) 301	9,536	11,255	21,300	32,525	7.03	402,564	27,631	430,195	92.97
Inyo.....	6,458,240	8,812	26,817	147,935	183,564	84,205	267,769	4.15	2,582,585	3,607,886	6,190,471	95.85
Mono.....	1,948,800	5,149	(A) 25,516	25,942	56,671	526,720	563,391	29.94	1,144,652	220,757	1,365,409	70.06
Area 8.....	6,180,480	957,851	794,975	1,414,699	3,167,525	1,003,880	4,171,405	67.49	1,482,977	526,098	2,009,075	32.51
Calaveras.....	657,920	9,858	40,203	328,471	378,532	143,372	521,904	79.33	84,618	51,398	136,016	20.67
Mariposa.....	931,200	4,062	27,189	210,038	241,289	186,464	427,753	45.94	387,314	116,133	503,447	54.06
Merced.....	1,269,120	254,805	228,584	390,560	873,949	268,348	1,142,297	90.01	-----	126,823	126,823	9.99
San Joaquin.....	902,400	424,862	196,807	131,043	752,712	101,830	854,542	94.70	-----	47,858	47,858	5.30
Stanislaus.....	963,840	258,844	242,084	188,533	689,461	220,257	909,718	94.38	-----	54,122	54,122	5.62
Tuolumne.....	1,456,000	5,420	60,108	166,054	231,582	83,609	315,191	21.65	1,011,045	129,764	1,140,809	78.35

TABLE 15—Continued
LAND USAGE IN CALIFORNIA BY AVIATION AREAS AND COUNTIES—1940

Area County	Total Acres	Privately Owned							Publicly Owned			
		Farm				Other Private Land	Sub- total	Percent of Total Acres	National Forests and Parks	Other Public Lands	Sub- total	Percent of Total Acres
		Land in Crops	Idle Crop- land	Woodland, All Other	Farm- land, Total							
Column	1	2	3	4	5	6	7	8	9	10	11	12
Area 9. San Francisco Metropolitan	4,472,320	749,916	835,843	1,501,113	3,086,873	934,419	4,021,292	89.92	425	450,603	451,028	10.08
Alameda	469,120	92,057	81,768	74,618	248,443	105,388	353,831	75.42		115,289	115,289	24.58
Contra Costa	469,760	102,409	124,944	77,071	304,424	127,432	431,856	91.93		37,904	37,904	8.07
Marin	333,440	22,219	75,080	124,620	221,919	94,971	316,890	95.04	425	16,125	16,550	4.96
Napa	505,600	60,427	65,312	233,752	359,491	76,051	435,542	86.14		70,058	70,058	13.86
San Francisco	28,800	317	(B)	72	390	15,263	15,653	54.35		13,147	13,147	45.65
San Mateo	290,560	38,366	40,355	46,345	125,066	113,091	238,157	81.96		52,403	52,403	18.04
Santa Clara	835,200	160,717	122,570	323,513	606,800	156,320	763,120	91.37		72,080	72,080	8.63
Solano	529,280	151,454	196,488	172,321	520,263	565	520,828	98.40		8,452	8,452	1.60
Sonoma	1,010,560	121,950	129,326	448,801	700,077	245,338	945,415	93.55		65,145	65,145	6.45
Area 10.	5,728,640	711,855	722,316	957,569	2,391,740	1,584,808	3,976,548	69.42	1,261,977	490,115	1,752,092	30.58
Amador	380,160	10,781	41,589	255,087	307,457	2,463	309,920	81.52	69,981	259	70,240	18.48
El Dorado	1,104,000	12,126	51,068	193,310	256,504	306,276	562,780	50.98	438,957	102,263	541,220	49.02
Nevada	626,560	4,936	17,068	92,104	114,108	296,739	410,847	65.57	140,139	75,574	215,713	34.43
Placer	915,840	49,856	82,272	82,656	214,784	411,075	625,859	68.34	218,243	71,738	289,981	31.66
Sacramento	630,400	173,105	203,621	54,653	431,379	155,119	586,498	93.04		43,902	43,902	6.96
Sierra	613,120	11,305	37,399	11,401	60,105	134,781	194,886	31.79	359,851	58,383	418,234	68.21
Sutter	388,480	186,977	55,207	44,929	317,113	44,731	361,844	93.14		26,636	26,636	6.86
Yolo	661,760	225,713	136,280	115,265	477,258	91,881	569,139	86.00		92,621	92,621	14.00
Yuba	408,320	37,056	67,812	108,164	213,032	141,743	354,775	86.89	34,806	18,739	53,545	13.11
Area 11.	5,978,880	110,278	318,468	1,623,356	2,052,102	2,088,690	4,140,792	69.26	974,025	864,063	1,838,088	30.74
Del Norte	641,920	4,650	14,929	19,579	39,158	165,162	204,320	31.83	90,045	347,555	437,600	68.17
Humboldt	2,286,720	35,288	165,393	615,999	816,680	860,784	1,677,464	73.36	474,821	134,435	609,256	26.64
Lake	803,840	26,609	26,602	176,643	229,854	162,171	392,025	48.77	242,890	168,925	411,815	51.23
Mendocino	2,246,400	43,731	111,544	811,135	966,410	900,573	1,866,983	83.11	166,269	213,148	379,417	16.89
Area 12.	4,549,760	521,397	729,902	1,537,270	2,788,569	700,168	3,488,737	76.68	713,771	347,252	1,061,023	23.32
Butte	1,065,600	136,272	160,566	285,941	582,779	313,266	896,045	84.09	111,524	58,031	169,555	15.91
Colusa	737,920	156,454	166,064	114,512	437,030	132,978	570,008	77.25	63,670	104,242	167,912	22.75
Glenn	842,880	160,063	212,258	169,234	541,555	88,854	630,409	74.79	183,930	28,541	212,471	25.21
Tehama	1,903,360	68,608	191,014	967,583	1,227,205	165,070	1,392,275	73.15	354,647	156,438	511,085	26.85
Area 13.	7,175,680	192,377	181,161	977,499	1,350,037	1,169,032	2,519,069	35.11	2,996,819	1,659,792	4,656,611	64.89
Lassen	2,910,720	60,319	64,301	481,715	606,335	482,432	1,088,767	37.41	612,135	1,209,818	1,821,953	62.59
Modoc	2,620,160	112,916	89,560	380,713	583,189	315,633	998,822	34.30	1,305,131	416,207	1,721,338	65.70
Plumas	1,644,800	19,142	26,300	115,071	160,513	370,967	531,480	32.31	1,079,553	33,767	1,113,320	67.69
Area 14.	8,544,000	134,655	147,352	1,138,625	1,420,632	1,802,986	3,223,618	37.73	4,468,396	851,986	5,320,382	62.27
Shasta	2,461,440	33,075	54,245	447,371	534,691	915,163	1,449,854	58.90	620,854	390,732	1,011,586	41.10
Siskiyou	4,040,320	96,154	82,392	520,950	699,496	609,167	1,308,663	32.39	2,478,571	253,086	2,731,657	67.61
Trinity	2,042,240	5,426	10,715	170,304	186,445	278,656	465,101	22.77	1,368,971	208,168	1,577,139	77.23

(A) Partial figures—Additional data for cropland included only in state total.

(B) Data for cropland included only in state total.

* Estimated apportionment of county total for Riverside and San Bernardino between Areas 2 and 3.

Source: United States Bureau of the Census, 1940. Census of Agriculture, 1939.

pass the upper end of the valley agricultural belt from the Pacific Coast to the Nevada border. These forest lands extend along the valleys' borders intermittantly to the Mexican border on the west, and solidly to

Mojave Desert on the east and south. Ownership of timberland in California is divided almost equally between private and Federal ownership, being 9,825,340 and 9,880,453 acres respectively.

5. RECREATIONAL AREAS

Although the population of California is predominantly urban, a considerable part of the leisure time of city dwellers is spent in recreation outside the cities. Thousands of citizens of California and visitors in equally large numbers make comparatively little use of parks, play-grounds and other public recreation facilities in cities. Their daily recreation is found at home, in clubs or in commercial amusement or game centers; their vacations, however, are spent away from the con-

finer of their home cities—at resorts, scenic points of interest, National Forests and Monuments, National and State Parks, ocean beaches, lake and desert areas. Many factors contribute to this situation.

In 1945 California's per capita income exceeded the National average by \$280, allowing greater means for more frequent and extensive trips to recreational facilities away from home.

CALIFORNIA AIRPORTS

TABLE 16

VOLUME OF VISITORS TO NATIONAL PARKS AND MONUMENTS BY CALIFORNIA AVIATION AREAS—1941 AND 1946

Area	Name	County Location	Point of Entry	1941 No. of Visitors	1946 No. of Visitors
Area 1.	Cabrillo.....	San Diego.....		NA	NA
Area 2.	Channel Islands.....	Los Angeles..... Ventura.....		NA	NA
Area 3.	Joshua Tree.....	San Bernardino..... Riverside.....	Twentynine Palms.....		
				27,364	34,420
Area 5.	Channel Islands.....	Ventura.....	(See above, Area 2).....		
	Death Valley.....	San Bernardino.....	(See below, Area 7).....		
	Pinnacles.....	San Benito.....	Pinnacles.....		
				28,036	15,888
Area 6.	Sequoia*.....	Tulare.....	Ash Mountain..... Lost Grove..... Mineral King..... Trails.....	211,440 71,568 13,258 3,746	232,621 66,925 8,488 4,522
				300,012	312,556
	Devil Postpile.....	Madera.....	Mammoth Lake (Mono).....	10,241	11,000
	King's Canyon*.....	Fresno.....	Grant Grove (Tulare).....	172,271	219,976
	Millerton Lake** (Friant).....			NA	(Est.) 25,000
	Yosemite*.....	Mariposa..... Madera..... Tuolumne.....	Arch Rock..... South Entrance..... Big Oak Flat..... Tioga Pass (Mono)..... Other Roads.....	245,421 214,853 67,806 49,170 16,812	269,489 241,450 77,787 53,041
				594,062	641,767
				1,076,586	1,210,299
Area 7.	Death Valley.....	Inyo.....	West and East Roads.....		
		San Bernardino.....		96,529	77,884
Area 8.	Yosemite*.....	Mariposa..... Tuolumne.....	(See above, Area 6).....		
Area 9.	Muir Woods.....	Marin.....	Mill Valley.....		
				133,517	264,287
Area 11.	Mendocino Woodlands**.....	Mendocino.....		NA	NA
Area 12.	Lassen Volcanic*.....	Tehama.....	(See below, Area 14).....		
Area 13.	Lassen Volcanic*.....	Lassen..... Plumas.....	(See below, Area 14).....		
	Lava Beds.....	Modoc.....	(See below, Area 14).....		
Area 14.	Lassen Volcanic*.....	Shasta..... Lassen..... Plumas..... Tehama.....	Manzanita Lake..... Mineral.....	 108,663	 95,981
	Shasta Lake**.....	Shasta.....		NA	278,515
	Lava Beds.....	Siskiyou..... Modoc.....	Tulelake.....	34,659	27,221
				143,322	401,717
	Total.....			1,505,354	2,004,495

NA—Not available.

* National parks.

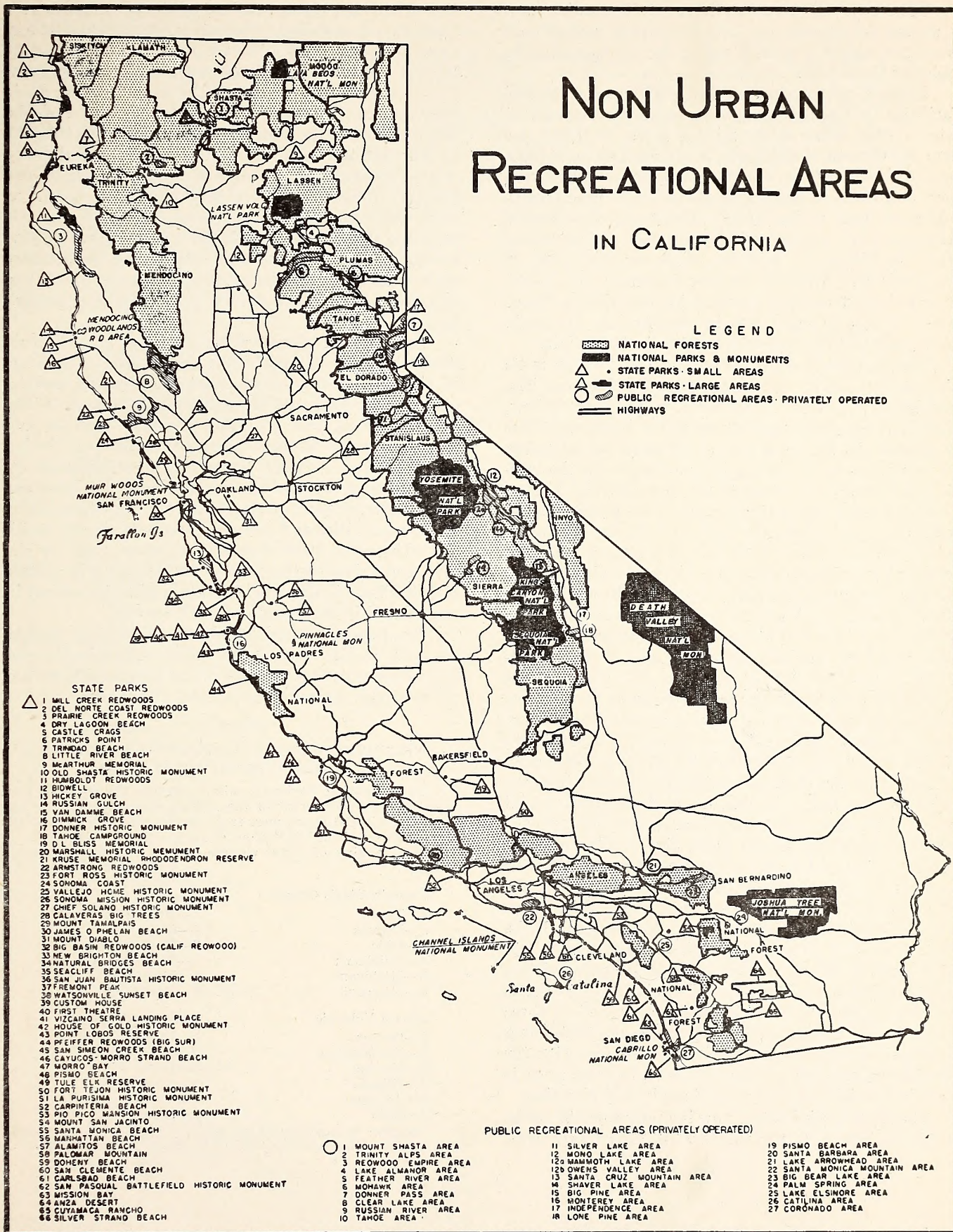
** National recreational areas.

Source: Department of the Interior, National Park Service.

Non Urban Recreational Areas in California

LEGEND

- NATIONAL FORESTS
- NATIONAL PARKS & MONUMENTS
- STATE PARKS - SMALL AREAS
- STATE PARKS - LARGE AREAS
- PUBLIC RECREATIONAL AREAS - PRIVATELY OPERATED
- HIGHWAYS



Generally, one of the requirements of vacationers is a change in climate and complementary recreational activities, which is readily met in the varying climatic zones of California.

There is a vast and complex pattern of areas and facilities in California serving larger increments of leisure time. Some thirty million acres, or thirty per cent of the area of the State, is represented in forests, parks, beaches, camps, resorts and cottage communities, bays and harbors, lakes, streams and wild life refuges, highways and trails which attract all vacationers, whether their means of transportation be motoring, flying or hiking. In addition, there are vast areas of unspoiled and difficult-of-access mountain and desert land which attract the private flying enthusiasts. These units all play a major role in contributing to health, well-being and the enjoyment of life in California.

The significant characteristic of this pattern is its obvious conformity to the terrain of California. The non-urban play areas of this State, with few exceptions, include those major natural assets for which the State is famous. As has been noted elsewhere, the existence of water in some attractive form accounts for the location of a large percentage of the more popular recreation areas. The shores and beaches of the Pacific and its many bays and inlets, the lakes and rivers and mountain streams constitute a common denominator for most of the play-grounds outside the cities of California.

The verdant mountains, preserved largely as National Forests and Parks, are extensive natural parks. The more unique and attractive areas serve extraordinary numbers annually. For example, Yosemite National Park with 641,767 visitors in 1946, is, at certain periods, as populous as the city of Modesto. In the same manner, Sequoia National Park with 312,556 visitors, Shasta Lake Recreational Area 278,515, Kings Canyon National Park 219,976 visitors for the year 1946, periodically have populations comparable to other thriving cities of the State. Under no circumstances would actual cities with such populations be omitted from the airport map of the State. Their airport requirements cannot be ignored because they are recreational areas, rather they should be specially treated because of the advantages of air travel to the vacationer. Mount Lassen National Park, Death Valley, Modoc Lava Beds, Muir Woods, The Pinnacles, Joshua Tree, Devil's Post Pile National Monuments, and others, contributed to a total of 2,004,495 visitors to California National Parks and Monuments in 1946. Approximately 90% of these visitors were residents of California, only 10% being from out of State. The facilities of transportation for all visitors, resident and non-resident, to these areas is a subject which requires careful study and planning.

The State Park System now includes some 80 parks and historic monuments, totaling 313,816 acres in area,

and preserving ocean beaches, lakes and streams, red-wood groves, and desert recreation areas for public use. Larger counties and cities likewise have many parks, playgrounds and summer mountain camps. These great public areas contain some of the most valuable basic resources of the State—its forests and water sheds. Visitors during the year 1946 totaled over 22,000,000.

The demand for facilities for recreation is directly related to population increase, but economic conditions, housing, industrial and commercial tasks, hours of work and leisure and other known factors are also elements in this problem. It is the responsibility of government to study and measure the increasing pressure upon existing recreation areas and to make timely reservation of lands for future public use and accessibility.

The problem of recreation planning in California is not alone that of acquiring a public park; it involves, in addition to the design, improvement and maintenance, the necessity of providing adequate accessibility of these areas. The provision of land, facilities and accessibility for this non-urban recreation is a divided responsibility. Federal, State and local agencies attempt to meet the needs as they see them, but no broad plan exists for their guidance and for the coordination of their activities and policies. Adequate airport facilities adjacent to these recreational areas, both for airlines and private flying, are a definite factor in a State Master Plan of Airports, and the subject is covered in more detail in other sections of this study.

The imposing total of almost 25,000,000 visitors annually to California's non-urban recreational areas represents a potential in air travel comparable to that of the major metropolitan centers of the State.

TABLE 17
VOLUME OF VISITORS TO NATIONAL PARKS AND
MONUMENTS IN CALIFORNIA—1946

By combining various available figures, it appears that approximately 10 percent of the visitors to national parks and monuments in California were from outside the state. This would give a total of about 170,000 out of state visitors for 1946.

The ranking of these visitors by state of origin was as follows:

<i>Sequoia-King's Canyon</i>	<i>Yosemite</i>
1—Texas	1—Illinois
2—Illinois	2—Ohio
3—Ohio	3—Texas
4—Oklahoma	4—Washington
5—Michigan	5—Michigan
6—Missouri	6—New York
<i>Lassen Volcanic</i>	<i>Southern California</i>
1—Oregon	1—Illinois
2—Washington	2—Missouri
3—Nevada	3—Iowa
4—Illinois	4—New York
5—Arizona	5—Texas
6—Ohio	6—Ohio

Source: Department of the Interior, National Park Service.
The All Year Club of Southern California, Ltd.

TABLE 18
VISITORS TO CALIFORNIA STATE PARKS—1946
BY AVIATION AREAS AND COUNTIES

		Number of Visitors		
Area 1.	San Diego			
	Anza Desert.....	27,036		
	Carlsbad Beach.....	5,000		
	Cuyamaca Rancho.....	81,728		
	Mission Bay.....	20,000		
	Palomar Mountain.....	6,148		
	San Pasqual Battlefield.....	15,000		
	Silver Strand.....	Navy		154,912
Area 2.	Los Angeles Metropolitan			
	Los Angeles			
	Alamitos Beach.....	150,000		
	Lummi Home "El Alisal".....	2,000		
	Manhattan Beach.....	208,000		
	Pio Pico Mansion.....	2,271		
	Santa Monica Beach.....	7,300,000		
	Will Rogers Beach.....	9,480,000		
	Will Rogers Park.....	81,950	17,224,221	
	Orange			
	Doheny Beach.....	180,000		
	Huntington Beach.....	35,000		
	San Clemente Beach.....	52,345	267,745	
				17,491,966
Area 3.	Desert Riverside			
	Mt. San Jacinto.....	7,677		
	Indian Creek Grove.....	5,000		12,677
Area 4.	Kern			
	Fort Tejon.....	1,000		1,000
Area 5.	Monterey			
	First Theatre.....	40,799		
	Fremont Peak.....	12,500		
	House of Gold.....	5,000		
	Junipero Serra Landing Place.....	15,000		
	Old Custom House.....	55,597		
	Pfeiffer Big Sur.....	86,232		
	Point Lobos Reserve.....	49,452		
	Stevenson House.....	3,000	267,580	
	San Benito			
	San Juan Bautista Mon.....		16,935	
	San Luis Obispo			
	Cayucos Beach.....	6,500		
	Morro Bay Park.....	98,650		
	Morro Strand.....	9,500		
	Pismo Beach.....	9,500		
	San Simeon Creek Beach.....	1,000	125,150	
	Santa Barbara			
	Carpinteria Beach.....	91,875		
	La Purisima Mission.....	13,246	105,121	
	Santa Cruz			
	Big Basin Redwoods.....	427,610		
	Natural Bridges Beach.....	15,000		
	New Brighton Beach.....	18,000		
	Seacliff Beach.....	223,425		
	Sunset Beach.....	12,000	696,035	
				1,210,821

CALIFORNIA AIRPORTS

TABLE 18—Continued
VISITORS TO CALIFORNIA STATE PARKS—1946
BY AVIATION AREAS AND COUNTIES

		Number of Visitors	
Area 8.	Calaveras		
	Calaveras Big Trees.....	72,801	72,801
Area 9.	Contra Costa		
	Mt. Diablo.....		79,211
	Marin		
	Mt. Tamalpais.....		46,475
	San Francisco		
	James D. Phelan Beach.....		75,000
	San Mateo		
	Portola Park.....		8,562
	Sonoma		
	Armstrong Redwoods.....	178,450	
	Fort Ross Historical Monument.....	16,888	
	Kruse Rhododendron.....	15,000	
	Sonoma Coast.....	61,990	
	Sonoma Mission.....	36,080	
	Vallejo Home Historical Monument.....	16,223	
			324,631
			533,879
Area 10.	El Dorado		
	D. L. Bliss Park.....	19,148	
	Gold Discovery Site.....	12,752	
	Marshall Historical Monument.....	12,500	
			44,400
	Nevada		
	Donner Historical Monument.....		59,560
	Placer		
	Tahoe Campground.....		31,020
			134,980
Area 11.	Del Norte		
	Del Norte Coast Redwoods.....	45,000	
	Mill Creek Redwoods.....	8,000	
			53,000
	Humboldt		
	Azalea Reserve.....	35,000	
	Burlington Campground.....	5,000	
	Dry Lagoon Beach.....	45,000	
	Dyerville Headquarters.....	10,335	
	Founder's Grove.....	245,000	
	Humboldt Redwoods.....	200,000	
	For area not included in special report:		
	Alexander Grove		
	Bull Creek Flats		
	Franklin K. Lane Grove		
	Whittemore S. Holbrook		
	Little River Beach.....	45,000	
	Patrick's Point.....	14,464	
	Prairie Creek Redwoods.....	20,400	
	Richardson Grove.....	190,000	
	Stephens Grove.....	1,500	
	Trinidad Beach.....	1,000	
	Van Duzen Redwoods.....	12,500	
	William's Grove.....	27,300	
			852,499
	Mendocino		
	Admiral Standley Grove.....	10,000	
	Dimmick Grove.....	5,000	
	Hickey Grove.....	1,000	
	Russian Gulch.....	13,394	
	Van Damme Beach.....	12,726	
			42,120
			947,619

TABLE 18—Continued
VISITORS TO CALIFORNIA STATE PARKS—1946
BY AVIATION AREAS AND COUNTIES

	Number of Visitors		
Area 12. Butte Bidwell Park.....	15,000		15,000
Area 14. Shasta Castle Crags.....	9,384		
McArthur-Burney Falls.....	13,509		
Old Shasta Town Historical Monument.....	11,000		
			33,893
Total.....			20,609,548

This total covers attendance records through the end of September. It has been estimated that the total for the entire year would amount to 22,176,433.

Source: California Department of Natural Resources, Division of Beaches and Parks.

No detailed breakdown is available for 1941 but the total attendance for that year was 13,000,000.

6. NATURAL ROUTES OF TRAVEL

California has three major north and south traffic arteries. The Coast Route, U. S. Highway 101, connects California's principal coastal cities—San Diego, Los Angeles, Santa Barbara, San Luis Obispo, San Francisco and Eureka—by a route which follows in general the low terrain of the coastal plain. Throughout much of its course it is literally a coast highway immediately adjacent to the Pacific. The second principal route, U. S. Highway 99, traverses the central portion of the State, connecting the principal inland cities of the Imperial Valley with Los Angeles, and the latter with all the important population centers of the rich San Joaquin and Sacramento River Valleys. This route lies approximately 100 miles inland from the coast and is separated therefrom by the Coast Range of mountains which vary in height from 2,000 to 6,000 feet. The third principal north and south artery, U. S. Highway 395, traverses that barren, sparsely settled but scenically grand, portion of California lying east of the Sierra Nevada Mountains. This route is also separated from the Central Valley route by a 100 mile wide mountain chain ranging in heights from 6,000 to 14,000 feet. This route affords a direct scenic path from San Diego through San Bernardino and Bishop, California; Carson City and Reno, Nevada; Susanville and Alturas, California; to eastern Oregon points.

With respect to lateral routes the State is less fortunate, since the mountain ranges referred to above afford relatively few low passes. The northernmost improved traverse route, U. S. Highway 299, connects Eureka on the coast with Redding in the Central Valley, and Alturas on the east. Two hundred miles further south the transcontinental Highways 40 and 50 connect San Francisco Bay cities with Stockton and Sacramento, thence via Auburn and Placerville with Reno and Carson City, Nevada, respectively. While four lesser passes cross the Sierra Nevada Mountains between Sacra-

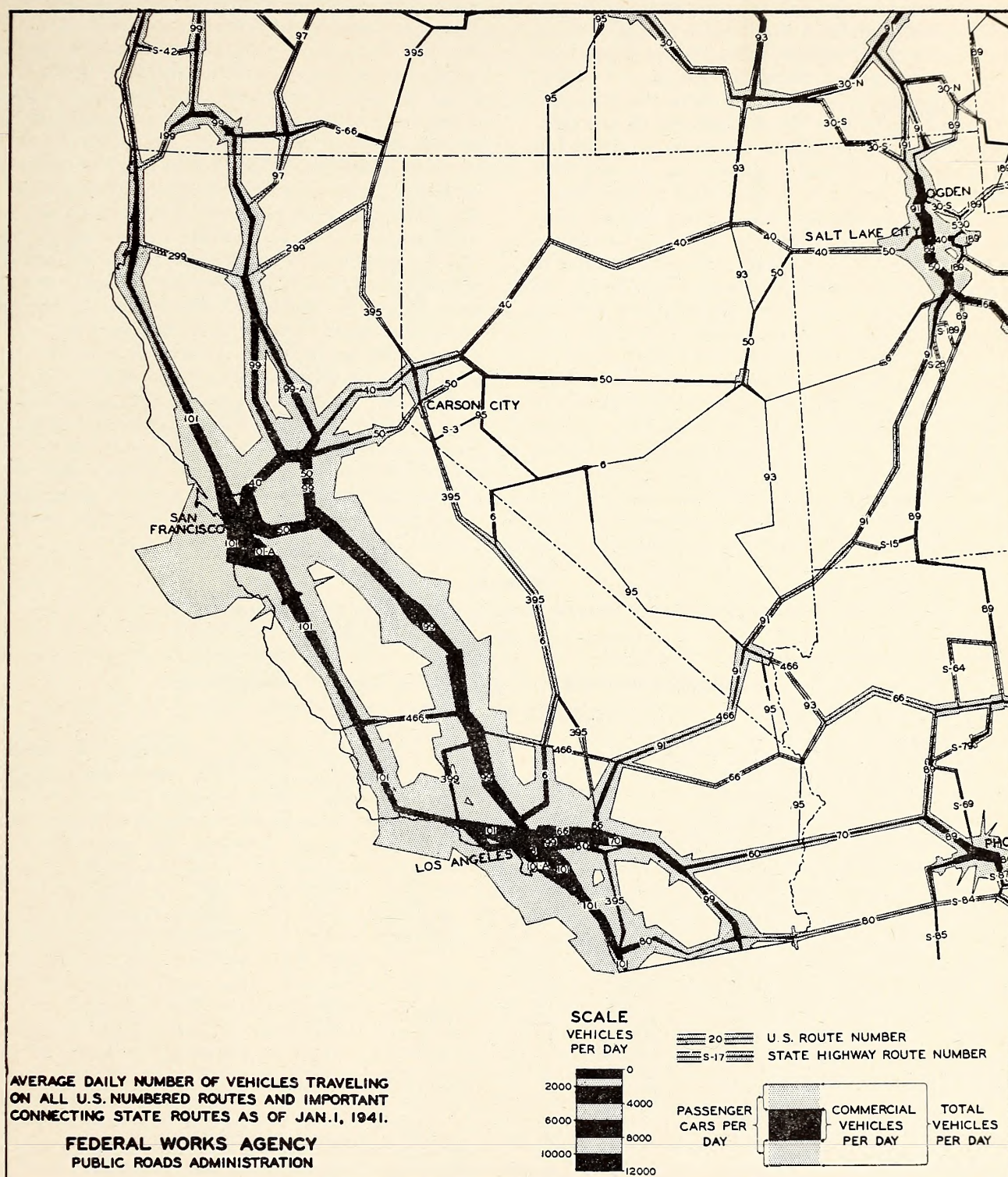
mento and Fresno none are serviceable the year round so that in reality there is approximately 300 miles between U. S. Highway 50 and the next all year highway through the Sierra Nevada Mountains, U. S. Highway 466 which connects San Luis Obispo on the coast with Bakersfield in the Central Valley and Barstow in the Mojave Desert with Las Vegas, Nevada. Originating in Los Angeles and extending eastward through Cajon and San Geronio Passes, are U. S. Highway 91 to Las Vegas, Nevada and Utah points; U. S. Highway 66 to Needles and northern Arizona points; U. S. Highways 60 and 70 to Blythe and central Arizona points. Originating at San Diego and closely following the Mexican border eastward is U. S. Transcontinental Highway 80 which serves southern Arizona points by way of Yuma gateway.

This general description of the California Highway system includes all of the main arteries of vehicular traffic which are important to the State's transportation system. The accompanying highway traffic flow chart graphically portrays the relative density of traffic over the several routes described, and may be utilized as an indication of the relative volume of traffic between California's principal population centers, thus indicating to a degree, at least, the comparative volume of air travel which might be expected on these same routes.

While other lesser routes penetrate both the Coast and Sierra Nevada Mountain ranges, they are secondary to the pattern, tortuous in alignment and contribute a very small percent to the total traffic flow. We therefore find a state 800 miles long and 200 miles wide, all of whose principal cities lie on or immediately adjacent to three main north and south arteries and six transverse traffic routes. Nor is this situation peculiar to vehicular traffic since these same routes are traversed by California's main rail lines. We find then a



STATE OF CALIFORNIA
MASTER PLAN OF AIRPORTS
STATE HIGHWAY SYSTEM



pattern for all forms of transportation serving the State which conforms to the natural topographic features which originally dictated the location of California's major centers of agriculture, industry and population. The earliest emigrants found the lowest and easiest passes in approaching California from the east, and these were later followed by the builders of railroads. Similarly, the most propitious routes were followed in establishing the north and south arteries, the first such route being El Camino Real established by the Mission Fathers along the Pacific Coast during the 18th Century. In each case the hamlets established on these major traffic routes and at their intersections, grew to become California's most important cities, which are now connected by a third and entirely new form of transportation, air travel. In consequence of this natural pattern which established the earlier forms of transportation, it now follows that the principal air routes between those major centers conform closely to the highway and railway pattern of the State; hence, the similarity to be noted between the maps designating California's principal highway and air routes.

One outstanding advantage which the airplane affords, however, is its ability to connect any two cities by direct line of flight regardless of terrain barriers.

This advantage can and will be utilized to augment the meager supply of transverse travel arteries in the State. For example, the drive by automobile over Highway 299 from Eureka to Alturas requires approximately ten hours for an airline distance of 200 miles, which the modern transport plane can easily traverse in one and one-half hours. Similar extraordinary time savings favoring transportation by air can be shown wherever travel by surface means involves traversing mountain passes or the following of circuitous routes. Air travel may thus add new routes to the California traffic pattern by making seaside resorts directly available in summer to residents of the hot inland cities, in a matter of minutes of travel time. Similarly, the resort areas of the Sierra Nevada Mountains, the Cascades and the northern Coastal Range may be made readily accessible to the principal centers of population from which they are now separated by hours of tedious surface travel. In this manner the age old pattern of transportation fixed by nature before the advent of civilization may be altered and improved in this 20th Century by utilization of the advantages afforded by air transportation but this can only be accomplished if adequate airports are provided wherever needed as termini for air transport.

TABLE 19
VOLUME OF HIGHWAY TRAFFIC INTO CALIFORNIA AT POINTS OF ENTRY
From October, 1945, Through September, 1946

Station	Number of Automobiles			Number of Passengers				
	California	Out of State	Total Autos	By Automobile		By Bus	Total Passengers	Percent of State Total
				California	Out of State			
Alturas.....	5,662	7,562	13,224	14,687	19,556	2,232	36,475	.61
Benton.....	9,713	7,173	16,886	24,557	18,785	385	43,727	.73
Blythe.....	116,140	157,615	273,755	327,324	439,126	177,324	943,774	15.78
Brockway.....	6,500	2,972	9,472	17,306	8,000	2,451	27,757	.46
Coleville.....	37,085	14,935	52,020	94,800	37,459	9,470	141,729	2.37
Daggett.....	70,190	96,711	166,901	220,950	287,879	62,229	571,058	9.55
Dorris.....	55,514	57,026	112,540	146,827	149,726	75,097	371,650	6.22
Fort Yuma.....	70,355	115,242	185,597	213,921	342,799	111,688	668,408	11.18
Hornbrook.....	66,623	74,957	141,579	175,538	200,423	115,565	491,526	8.22
Parker.....	8,420	12,252	20,672	21,507	31,974	14,208	67,689	1.13
Peavine.....	41,447	26,055	67,502	112,897	69,550	29,426	211,873	3.54
Redwood.....	38,932	46,358	85,290	105,733	132,875	6,039	244,647	4.09
Smith River.....	31,938	48,394	80,332	84,675	132,442	24,450	241,567	4.04
Stateline.....	19,945	14,995	34,940	53,730	40,803	2,447	96,980	1.62
Truckee.....	135,735	108,600	244,335	361,393	292,088	181,401	834,882	13.96
Tulelake.....	9,522	9,924	19,446	25,833	26,808	7,754	60,395	1.01
Woodfords.....	2,116	1,695	3,811	5,448	4,582	-----	10,030	.17
Yermo.....	160,778	125,631	286,409	431,985	343,433	140,056	915,474	15.32
Total.....	886,615	928,096	1,814,711	2,439,111	2,578,308	962,222	5,979,641	100.00

Source : California State Department of Agriculture.

TABLE 20
VOLUME OF HIGHWAY TRAFFIC INTO CALIFORNIA
October, 1945-November, 1946

	Number of Automobiles			Number of Passengers			
	California	Out of State	Total Autos	By Automobile		By Bus	Total Passengers
				California	Out of State		
October, 1945.....	77,062	69,316	146,378	213,359	190,221	51,215	454,795
November.....	61,299	69,002	130,301	168,838	189,362	74,256	432,456
December.....	58,096	74,449	132,545	160,566	206,478	74,433	441,477
January, 1946.....	54,494	73,335	127,829	152,856	202,598	74,744	430,198
February.....	42,299	67,217	109,516	113,265	180,644	69,074	362,983
March.....	48,706	69,554	118,260	128,333	185,451	74,116	387,900
April.....	56,551	63,538	120,089	149,331	168,210	70,217	387,758
May.....	66,798	70,732	137,530	173,689	189,530	82,508	445,727
June.....	87,325	89,959	177,284	234,948	255,483	90,567	580,998
July.....	114,525	96,321	210,846	326,394	282,285	100,701	709,380
August.....	113,107	101,113	214,220	327,681	298,905	106,231	732,817
September.....	106,353	83,560	189,913	289,851	229,141	94,160	613,152
Totals.....	886,615	928,096	1,814,711	2,439,111	2,578,308	962,222	5,979,641
October.....	83,261	68,608	151,869	212,206	181,226	79,307	472,739
November.....	57,467	64,383	121,850	148,623	165,186	72,110	385,919
Total.....	140,728	132,991	273,719	360,829	346,412	151,417	858,658
Total.....	1,027,343	1,061,087	2,088,430	2,799,940	2,924,720	1,113,639	6,838,299

Source: California State Department of Agriculture.

7. RELATIONSHIP TO NATION AND THE ORIENT

California's geographic location is a most strategic one in the relationship of the State to the Nation, forming as it does the extreme western boundary of the country and the gateway to trade with the Orient and Pacific; through this gateway passes practically all commerce of the Nation to that vast and fertile market, the Far East and the Pacific Basin, representing one-half of the world's population, where there is an increased demand for cooperation with the United States and markets far from being saturated.

World trade is important to the welfare of people all over the world and to the stabilization of world peace. It is vitally necessary to the Nation and to the State to maintain high employment in domestic agriculture, mining, industry, transportation and other services, and trade generally, to maintain the proper balance of imports and exports. It is obvious that most of the business of trading with the Pacific Basin and the Far East will be conducted in California and on the Pacific Coast.

California is fortunate in the possession of three fine harbors. Los Angeles is California's great man-made harbor. San Francisco and San Diego are two of the world's ten great natural harbors. Over a million tons of foreign imports and eight to ten million

tons of foreign exports are handled annually through Los Angeles and San Francisco ports, making them the first and second, respectively, ranking foreign trade districts on the Pacific Coast, and fourth and fifth in the Nation. San Diego is the first port of call for incoming and the last for outgoing vessels plying between the Pacific Coast and Mexico, Central and South America, Panama Canal and the Atlantic Coast.

Principal imports (in tonnage) handled through San Francisco and Los Angeles ports are bananas, copra, crude rubber, lumber, oil cake meal, sugar, coffee, fish, newsprint, vegetable oils and chemicals. Chief exports are, under normal conditions, petroleum products, canned, dried and fresh fruits, grains, machinery, chemicals, cotton, citrus fruits, borax, canned fish and cement.

Motion picture production, centered around Los Angeles, is a basic and principal industry in the State, providing one of its large and best known exports. Due to the concentration of this industry in Southern California, that area has become a style creating center for women's and children's clothing, and sports apparel, with a rapid growth in these industries.

The State had become the leading aircraft production center of the Nation prior to World War II, and

should continue to be the aircraft manufacturing center of the Nation, with war-added plant facilities, management, engineering skills, and trained workers. Aircraft and aircraft parts would appear destined to join the list of the State's leading exports.

There is a convergence of transcontinental railroads, steamship lines, truck lines, transcontinental bus services, airline routes and the Trans-Pacific Air Service in this State. Most of the major airlines of the world have acquired or are seeking airport facilities in California. Pan-American World Airways, with a major terminal in San Francisco, carried more than 18,000 persons in 1946 from San Francisco to Honolulu over their newly resumed service. Other such carriers are carrying heavy tonnages of cargo and passengers across the Pacific from California bases. Many items in the perishable category, previously considered impossible of export or import, are now being handled as air cargo. Obviously with increased development of this means of transportation countless items will be added to our lists of leading imports and exports, boundlessly increasing their present scope.

California is in a position not only to maintain but to steadily increase the standing of the State in world air travel and trade if the importance of ground

facilities for air transport is properly evaluated and planned for now. In this position California might easily become the cross roads of the world airlines, one of the major transportation terminals and trade centers of the Nation.

Seven international air transport lines now connect California cities of Los Angeles and San Francisco with the Orient, Australasia, Central and South America. Other projected services are in prospect. The growth of surface shipping through Pacific ports which followed World War I is being repeated by Air Transport following World War II and bids fair to become a most important factor in the economic progress of the entire Pacific Coast.

Aerial commerce by the international airways offers California industry and agriculture vast new markets with delivery in days instead of weeks and the whole process of exchange accelerated accordingly.

The cities of San Francisco, Los Angeles and San Diego are already established ports of call on international air routes and are planning aviation facilities accordingly. Other costal cities having serviceable airports will undoubtedly become alternates in this promising new development. The subject is treated more extensively in a following section under "Aeronautical Growth and Projections."

PART III—ECONOMIC FACTORS

1. NATURAL RESOURCES

The State has a sufficient diversity of the great natural economic resources to enable its people to sustain themselves as an isolated empire if necessary, but without trade it would be on a lower scale than is now enjoyed.

Every agricultural product of the temperate zone is produced in California, as are many subtropical crops not grown elsewhere in the United States. All of the staple foods and all of the textile materials from cotton to wool are produced. Silk is not yet produced commercially, but experiments have demonstrated its possibility. Even the guayule plant for production of rubber is being grown. The lands of the State which have value for agricultural use, together with the climatic conditions and the water to make them productive, are foremost of the natural resources of California. These are discussed more in detail in the following section on "Agriculture."

Mineral resources include almost all of the basic materials used in the chemical, structural material, and metal working industries. Some of these, such as iron ore, chromite, and manganese, are now being developed for expansion of the iron and steel industries, due to wartime development. In recent years about sixty different minerals have been produced in California

under the general heading of metals, fuels, structural materials, industrial materials and salines. The more important of these, on a volume and value basis, are shown in the accompanying Table 21, California Mineral Production—1944 and 1945. Gold was the economic resource which led to California's first development. Since 1849 gold mines of this State have yielded more than \$2,250,000,000 in treasure. Now the annual yield of \$40,000,000 from gold mines, for normal years, is only a small part of the economic returns of the State. The output of gold dropped sharply during the war with gold production shut down by Government restrictions between 1942 to 1945, but is now showing marked increase once again. California ranked third in the prewar year of 1939 among the states of the Nation in value of principal mineral products; copper, gold, silver, lead, zinc, stone, petroleum, natural gas, natural gasoline, cement, clay, sand and gravel. California's percentage of total value for the United States in these products was 11.04 for that year (California State Division of Mines).

Petroleum has far outstripped gold as a source of new wealth from mineral production in California. As against California's 11.04% of the total national value of principal mineral products in 1939, above mentioned,

TABLE 21
CALIFORNIA MINERAL PRODUCTION—1944 AND 1945

Mineral	Units	Output		Value of product	
		1944	1945	1944	1945
Total Value.....				\$469,774,525	\$488,244,000
Fuels.....				362,457,220	384,316,000
Natural gas.....	M cu. ft.....	467,743,258	544,543,000	31,797,418	36,484,000
Petroleum.....	Bbls.....	311,717,804	328,144,000	330,659,802	347,832,000
Metals.....				24,040,256	20,862,000
Copper.....	Lbs.....	25,584,865	13,810,000	3,453,957	1,878,000
Gold.....	Fine ozs.....	117,373	172,000	4,108,055	6,023,000
Quicksilver.....	Flasks.....	28,097	22,800	3,178,969	2,918,000
Tungsten Ore.....	20 lbs.—W. 0.3.....	203,965	a	4,835,810	a
Zinc.....	Lbs.....	16,456,103	17,870,000	1,875,996	2,055,000
Others.....				6,587,469	a
Structural materials.....				50,777,220	53,156,000
Industrial materials.....				11,515,327	11,700,000
Salines.....				20,983,104	18,210,000
Unapportioned—All others.....				1,398	

Note: a Not separately reported in preliminary 1945 figures.
Source: California State Division of Mines.

CALIFORNIA AIRPORTS

TABLE 22
MINERAL PRODUCTION IN CALIFORNIA BY AVIATION AREAS

Area Number and Name	1930			1935			Percent Change, 1930 to 1935
	Mineral Production	Percent of California	Percent of U. S.	Mineral Production	Percent of California	Percent of U. S.	
United States ^a	\$4,764,800,000		100.00	\$3,650,000,000		100.00	-----
California ^b	365,604,695	100.00	7.67	263,404,317	100.00	7.22	-27.95
1. San Diego Metropolitan.....	1,303,047	.36	.03	471,387	.18	.01	-63.82
2. Los Angeles Metropolitan*.....	205,694,096	56.26	4.31	103,122,791	39.15	2.83	-49.87
3. Desert*.....	6,503,483	1.78	.14	5,624,044	2.14	.15	-13.52
4. Kern County.....	42,987,977	11.76	.90	46,944,409	17.82	1.29	9.20
5. Mid Coastal.....	60,772,959	16.62	1.27	25,090,938	9.52	.69	-58.71
6. Fresno Metropolitan.....	16,360,242	4.47	.34	40,957,243	15.55	1.12	150.35
7. Inyo-Mono.....	2,412,250	.66	.05	1,792,995	.68	.05	-25.67
8. Stockton Metropolitan.....	4,404,193	1.20	.09	6,367,506	2.42	.17	44.58
9. San Francisco Bay.....	8,895,878	2.43	.19	5,764,156	2.19	.16	-35.20
10. Sacramento Metropolitan.....	9,491,672	2.60	.20	22,449,619	8.52	.62	136.52
11. Redwood Empire.....	863,389	.24	.02	464,833	.18	.01	-46.16
12. Chico-Red Bluff.....	877,385	.24	.02	1,064,531	.40	.03	21.33
13. Modoc Plateau.....	3,254,244	.89	.07	488,680	.19	.01	-84.98
14. Shasta Cascade.....	1,783,880	.49	.04	2,801,185	1.06	.08	57.03

Area Number and Name	1940			Percent Change 1935 to 1940	1945		Percent Change 1940 to 1945
	Mineral Production	Percent of California	Percent of U. S.		Mineral Production	Percent of California	
United States ^c	\$5,582,500,000		100.00	-----	(Not available)	-----	-----
California ^c	342,825,817	100.00	6.14	30.15	\$473,661,591	100.00	38.16
1. San Diego Metropolitan.....	845,207	.25	.02	79.30	1,142,350	.24	35.16
2. Los Angeles Metropolitan*.....	126,584,332	36.92	2.26	22.75	153,822,603	32.48	21.52
3. Desert*.....	9,327,238	2.72	.17	65.85	13,063,543	2.76	40.06
4. Kern County.....	62,855,732	18.33	1.13	33.89	126,716,070	26.75	101.60
5. Mid Coastal.....	33,672,540	9.82	.60	34.20	59,477,316	12.56	76.63
6. Fresno Metropolitan.....	36,083,552	10.53	.65	-11.90	65,692,070	13.87	82.06
7. Inyo-Mono.....	3,540,137	1.03	.06	97.44	4,351,678	.92	22.92
8. Stockton Metropolitan.....	11,710,178	3.42	.21	83.91	6,344,285	1.34	-45.92
9. San Francisco Bay.....	13,683,731	3.99	.25	137.39	24,617,796	5.20	79.91
10. Sacramento Metropolitan.....	30,891,585	9.01	.55	37.60	13,369,484	2.82	-56.72
11. Redwood Empire.....	1,151,816	.34	.02	147.79	859,035	.18	-25.42
12. Chico-Red Bluff.....	2,836,924	.83	.05	166.50	812,660	.17	-71.35
13. Modoc Plateau.....	2,851,519	.83	.05	483.51	255,034	.05	-91.06
14. Shasta Cascade.....	6,791,326	1.98	.12	142.44	3,137,667	.66	-53.80

* Estimated apportionment of county total for Riverside and San Bernardino between Areas 2 and 3.

Sources: ^a Minerals Yearbook—Review of 1940.

^b Division of Mines—Bulletin 110-112.

^c Division of Mines—Bulletin 130.

^d Division of Mines, Press Bulletin No. 283.

^e California State Chamber of Commerce—Economic Survey Series 1944-1945, Report No. 21.

in the prewar year of 1940, the State produced 296,-683,000 barrels of crude petroleum, 22% of the Nation's total in this one product for that year. Oil fields in 1944 produced 289,708,000 barrels of crude oil, valued at \$275,800,000. Since the discovery of oil in California over 5,000,000,000 barrels, with average value of about a dollar a barrel, have been produced. Proven oil reserves in known fields are over 3,500,000,000 barrels, or more than a fourth of the national total. Petroleum and coal are the two basic sources of materials for the synthetic chemical and plastics industries, now so important. Natural gas production amounts to about

300,000,000,000 cubic feet annually, and is piped to most of the industrial centers of the State for use as fuel (U. S. Bureau of Mines).

Commercial timber resources of California include about 39,000,000,000 board feet of redwood, and 177,-000,000,000 board feet of pine, fir and other species. Most of the pine lumber is consumed within the State, but redwood is exported to all parts of the world. The following tabulation of Potential and Actual Lumber Production in California, Table 23, indicates the distribution of these resources by Aviation Areas and Counties in the State (U. S. Dept. of Agriculture).

TABLE 23
POTENTIAL AND ACTUAL LUMBER PRODUCTION IN CALIFORNIA BY AVIATION AREAS AND COUNTIES, 1945

	Total Volume	Percent Available	Amount Available	Number Mills Active	Production 1945	Percent of California
California.....	243,431,000		182,458,290	457	2,260,792	100.00
	(M ft. B.M.)		(M ft. B.M.)		(M ft. B.M.)	
Area 1. San Diego.....	245,000	7	17,150	2	406	.02
Area 2. Los Angeles Metropolitan.....	97,000					
Los Angeles.....	97,000					
Orange.....						
West Riverside.....						
Southwest San Bernardino.....						
Area 3. Desert.....	703,000		53,600	4	811	.04
Imperial.....						
Riverside.....	167,000					
San Bernardino.....	536,000	10	53,600	4	811	.04
Area 4. Kern.....	806,000	89	717,340	1	6,625	.29
Area 5.	1,640,000		410,700		13,779	.61
Monterey.....	422,000					
San Benito.....						
San Luis Obispo.....	15,000					
Santa Barbara.....	18,000					
Santa Cruz.....	896,000	31	277,760	7	13,779	.61
Ventura.....	289,000	46	132,940			
Area 6.	18,381,000		9,175,750	31	61,777	2.73
Fresno.....	6,412,000	53	3,398,360	7	19,354	.86
Kings.....						
Madera.....	3,975,000	83	3,299,250	8	18,863	.83
Tulare.....	7,994,000	31	2,478,140	16	23,560	1.04
Area 7.	1,201,000		1,056,380	2	4,971	.22
Alpine.....	402,000	58	273,360			
Inyo.....						
Mono.....	799,000	98	783,020	2	4,971	.22
Area 8.	15,458,000		12,744,240	54	162,060	7.17
Calaveras.....	3,725,000	99	3,687,750	16	93,990	4.16
Mariposa.....	3,321,000	65	2,158,650	18	8,615	.38
Merced.....						
San Joaquin.....						
Stanislaus.....						
Tuolumne.....	8,412,000	82	6,897,840	20	59,455	2.63
Area 9. San Francisco Metropolitan.....	4,782,000		2,183,090	10	4,820	.21
Alameda.....						
Contra Costa.....	4,000					
Marin.....	242,000					
Napa.....	42,000	30	12,600			
San Francisco.....						
San Mateo.....	910,000					
Santa Clara.....	63,000	36	22,680			
Solano.....						
Sonoma.....	3,521,000	61	2,147,810	10	4,820	.21

TABLE 23—Continued

POTENTIAL AND ACTUAL LUMBER PRODUCTION IN CALIFORNIA BY AVIATION AREAS AND COUNTIES, 1945—Continued

	Total Volume	Percent Available	Amount Available	Number Mills Active	Production 1945	Percent of California
	(M ft. B.M.)		(M ft. B.M.)		(M ft. B.M.)	
Area 10.....	25,228,000		21,978,650	105	342,672	15.16
Amador.....	1,665,000	97	1,615,050	5	48,437	2.14
El Dorado.....	9,319,000	89	8,293,910	34	144,462	6.39
Nevada.....	2,651,000	92	2,438,920	17	19,618	.87
Placer.....	5,065,000	89	4,507,850	22	24,214	1.07
Sacramento.....						
Sierra.....	4,620,000	70	3,234,000	6	*47,989	2.12
Sutter.....						
Yolo.....						
Yuba.....	1,908,000	99	1,888,920	21	57,952	2.57
Area 11.....	79,081,000		57,282,820	107	642,988	28.44
Del Norte.....	11,844,000	68	8,053,920	5	22,286	.99
Humboldt.....	45,919,000	66	30,306,540	49	418,532	18.51
Lake.....	1,649,000	74	1,220,260	8	17,084	.75
Mendocino.....	19,669,000	90	17,702,100	45	185,086	8.19
Area 12.....	12,946,000		11,720,120	36	109,121	4.83
Butte.....	3,857,000	98	3,779,860	27	94,180	4.17
Colusa.....	269,000	70	188,300			
Glenn.....	1,516,000	97	1,470,520	†	†	
Tehama.....	7,304,000	86	6,281,440	9	14,941	.66
Area 13.....	30,657,000		28,726,970	34	484,948	21.45
Lassen.....	8,245,000	97	7,997,650	6	245,617	10.86
Modoc.....	5,514,000	94	5,183,160	9	58,525	2.59
Plumas.....	16,898,000	92	15,546,160	19	180,806	8.00
Area 14.....	52,206,000		36,391,480	64	425,814	18.83
Shasta.....	15,064,000	84	12,653,760	23	139,252	6.16
Siskiyou.....	21,528,000	74	15,930,720	24	268,678	11.88
Trinity.....	15,614,000	50	7,807,000	17	17,884	.79

* Combined with Nevada to avoid disclosing output of individual establishments.

† Combined with Tehama to avoid disclosing output of individual establishments.

Source: Total volume and amount available from California Forests and Range Experiment Station, Forest Survey Release No. 4, March 1, 1946.

Production 1945 from United States Department of Agriculture Forest Service, California Forest and Range Experiment Station, Forest Research Notes, No. 50, September 12, 1946.

Airplane Forest Patrol

The first use of aircraft in aerial fire patrol, for the protection of National Forests was made in California in the summer of 1919 when, with Army Air Corps cooperation, under General Arnold (then Major Arnold), patrols were established from Rockwell, March and Mather Fields, and later at Fresno and Red Bluff. Seven routes were established covering fifteen of the eighteen California forests with one airplane assigned to each route. Patrols were made twice daily over these predetermined routes, and between June 1st and October 31st, a total of 2,457 hours of flying, covering 200,000 miles resulted in the early spotting of 442 fires which were reported by radio, carrier pigeon and notes dropped from the planes.

There being no Forest Service appropriation for the use of aircraft, the first year's costs were borne entirely by the Army Air Corps. The experiment, however, justified a Forest Service appropriation of \$50,000 for the fiscal year of 1920-21, most of which was expended during the summer of 1920 for a similar system of regular patrols by Army Air Corps aircraft. During this season the mileage covered exceeded 476,000.

A similar arrangement followed in the summer of 1921 with patrols extended throughout California, Oregon and Washington. Forest Service appropriations then ceased for three years and only occasional patrols were undertaken at Army expense.

During 1925, 26 and 27 appropriations were forthcoming to resume the patrols, using Army aircraft flown by Reserve and National Guard pilots.

In 1928 the Army was unable to furnish aircraft and the first utilization of commercial aircraft was inaugurated upon a contractual basis, which arrangement has been followed since that date.

The principal utility of aircraft in those early days was fire detection. In more recent years their utility has been developed by protection agencies. Throughout the National and State Forests, and especially in California, the increase in population has increased the use of the forests, and consequently heightened the fire hazard. The need for continuous observation for fire detection dictated the establishment of permanent forest lookouts and a network of communications which largely eliminated aircraft as bases for fire detection.

However, as this use decreased and fires became more numerous, the need for quick access with adequate fire-fighting equipment became apparent. The establishment of numerous tanker stations which in turn demanded elaborate, costly access roads tended to defeat the objective, since roads in turn further increased the hazards.

The utility of aircraft as tools for fire control became more and more important. When large fires develop it is extremely desirable to know their location and behavior intimately. Lives, property and watersheds are threatened. Ground reconnaissance is too slow, cumbersome and dangerous. The airplane, as a reconnaissance tool with which to maintain contact and from which to direct ground operations, is as essential to the fire warden as to the general in battle.

During the 1930's the Forest Service undertook experiments to utilize aircraft as a means of initial attack. Huge reaches of forest land were inaccessible by roads or trails. In these areas, the major "firebug"—lightning—wrecks havoc each season. Days of delay in reaching the fire adds to the toll. The airplane offered a solution to this problem. Parachutes were designed to drop men, equipment and tools in rough, forested terrain with comparative safety. With the advent of World War II the dropping of para-fire-fighters was an accepted, successful and safe practice. In over ten years of work and experiment only minor injuries were suffered by jumpers. Delay in reaching fires was cut from days to hours—even minutes. Experience gained proved useful to military authorities with the advent of hostilities in the formation of the para-troop corps.

During 1945 the use of fire jumpers was extended, 1,452 jumps being made in fighting 292 fires. Their use materially lessens the need for access roads for fire protection of remote forest areas. Air transportation provided the alternative method for depositing fire fighters, equipment and supplies at the scene in minimum time, its use being limited only by the availability of suitable operating bases—airports—at minimum distance from such inaccessible areas. This report makes

frequent reference to the need for such airports in areas of heavy forestation. In providing such facilities we afford protection to our water sheds and minimize losses in our forest resources.

Large fires require large numbers of men, properly directed, for successful control. A major problem of the Forest Service has been that of concentrating its widely scattered force of experienced man-power in a given area with minimum delay. Here again air transportation has reduced the time element from days to hours. However, the net saving in time is again contingent upon the strategic location of airports in forest areas. Airports close to potential danger areas are essential for reconnaissance, administration and logistics.

The three general types of airports required by the Forest Service for successful use of aircraft in their important work are:

1. Administration Airport—the airport designed primarily for light reconnaissance type aircraft used for observation, aerial photography and point to point transport, located in close proximity to Ranger Stations and suitable for year round use. The forester of the future will perform most of his work and travel by air.

2. Fire Control Airport—an airport also designed for light reconnaissance aircraft strategically located in areas of great fire hazard for use in landing supervisory personnel near the fire, and as a base for fire reconnaissance. Such airports need only be fair weather fields but they must be strategically located to provide full coverage of forests and access to any possible scene of action within one hour road time.

3. Logistics Airports—airports suitable for transport type aircraft employed in assembling fire fighters, equipment and supplies. Commercial airports of suitable size within two hours travel time by road are considered adequate for this purpose.

Neither Federal nor State forest agencies have been granted funds with which to supply needed airport facilities, although a few remote fields have been constructed to date by the National Forest Service. The National Airport Act provided for matching funds of other Federal agencies for the construction of public airports suitable for fire control and providing access to recreational areas. Under this provision it may be anticipated that appropriations will be forthcoming for this purpose. To this end this survey includes numerous airport locations which have been recommended by both Federal and State Foresters. In nearly every instance such locations also provide aerial access to important recreational areas and provide emergency facilities along principal airways or routes of air travel. The early construction of the facilities recommended under this heading is essential to the economic welfare of the State.

Mining—Geology

The utility of aircraft in geological exploration is well established. Aerial mapping has made possible the accurate topographical mapping of huge areas in days where months were formerly required. Such maps accurately portray geologic faults, domes and outcroppings, and when augmented by visual inspection from the air by experienced geologists, they frequently aid in the detection of mineral or petroleum deposits. Moreover, such maps afford accurate estimates of vast forest resources, water storage areas, water resources and other useful engineering data.

The aircraft already has proven of value in providing speedy transportation for personnel and materiel between isolated mining or petroleum-producing areas and the centers of supply and supervision. Aircraft patrol pipelines and transmission lines to detect, and in many cases, forestall expensive breakdowns.

Fisheries

Fisheries in this State rank second among those of the United States. The fishing industry of the Pacific Coast is predominantly a canned fish and fish-oil-and-meal industry, in contrast to that of the Atlantic Coast which is predominantly a fresh fish industry. Despite the more recent development, the fisheries of the Pacific Coast slightly exceed the Atlantic Coast fishing industries in the volume of their production. This circumstance is due to the great magnitude of the sardine fishery, which is confined to the Pacific Coast, and which accounts for nearly half of the total yield of the region. Because the unit value of the products of the sardine fishery is lower than that of many other fisheries, the

total value of the catch to the fishermen is less on the Pacific Coast than on the Atlantic, but the value of the manufactured products is relatively greater. In the pre-war year of 1940, the Pacific Coast produced 50% of the total volume, 40% of the total value to fishermen and 57% of the value of manufactured fishery products produced by the Nation's three great fishery areas—Pacific Coast (including Alaska), Atlantic Coast and Lakes-Mississippi River. The State of California contributed 76.5%, or 1,290,445,900 pounds, to the total volume of the three Pacific Coast States. Including fishery off Latin America, 89% of all the fish taken on the Pacific Coast is landed in the ports of California. Of this yield 43% is landed in the Central California district and 45% in the Southern California district (Source—California Division of Fish and Game). Included in these large fishery yields, in addition to the sardines which rank first, crab, tuna, salmon and mackerel are important, and many other types are caught in less volume. Other marine resources, such as kelp, are being utilized for chemicals and fertilizers, and magnesium is extracted from sea water.

Aircraft have recently proven useful in patrols to aid in locating profitable fishing grounds, as well as in the enforcement of fishing regulations. Fishing fleets have thus been able to proceed directly to desirable fishing areas and to avoid days of fruitless search by older methods.

The adaptability of the airplane to the problems of surveying, developing and protecting the natural resources of the State and Nation is only beginning to be recognized. Consideration has been given to the establishment of suitable airports in the isolated areas of the State to facilitate the increased use of aircraft in these fields.

2. AGRICULTURE

Agriculture is an industry—indispensable in a balanced economy. It is vital to be able to feed, clothe and house the people of a nation. The mines and farms of any area are the basis of its manufactures, and operation of the factories of the United States leans heavily upon the mineral and agricultural resources of California and the western United States. Much greater quantities are withdrawn from both these sources than is necessary to meet the needs of the local population. With few exceptions—tobacco, soy-beans and peanuts—the crops of California and the western states generally, comprise the Nation's entire catalogue, and even those exceptions could be produced if economic pressure were sufficiently strong. Many of California's crops grow nowhere else in the country.

No clear cut line can be made between agriculture and manufacturing as it is difficult to determine the ending of one and the beginning of the other, since the farm origin of many manufactured articles is forgotten during their many mechanical processing phases

before final marketing—shoes, all leather goods, automobile steering wheels being cases in point.

There is a concerted endeavor to expand the usefulness of farm products through industrial research and the results to date have been most successful, and clearly indicative of the great potentialities in this field.

California is in the arid section of the United States, where little is grown without adequate irrigation. The West early became established in the national economy primarily as a source for raw materials—minerals, lumber, furs, hides, wool, etc. However, it became apparent late in the nineteenth century, and was emphasized by World War I, that proper development of the region, and support of an increased population depended upon balancing the agricultural and mining economies through the establishment of processing plants in the area. A new field has been opened for agriculture and a coordinated industrial development with the advent of the large "multiple-purpose" projects on the stream systems of California and neighbor-

ing states. These multiple-purpose projects primarily furnish storage of water for stabilization of the irrigation water supply, flood control, power as a by-product for processing plants; navigation and silt control to some extent, and other important economic features. It is the machine age in agriculture with particular reference to the processing of farm products for the markets.

The Central Valley Reclamation Project, being constructed by the United States Bureau of Reclamation, at a cost of \$360,000,000, will bring supplemental water supplies for irrigation, protection from floods, and other important benefits to the Sacramento and San Joaquin Valleys, but may not bring extensive acreage of new land under irrigation within the next three or four years. The same is true of the All-American Canal, bringing water to the Imperial and Coachella Valleys. Within the next decade these will add upwards of a half million acres of irrigable land.

At the time of the last general Census (1940) there were 132,658 farms in this State, embracing an area of 30,524,324 acres. Of this, some 6,534,000 acres were crop land harvested. The value of farms in 1940 was \$2,166,453,000. Capital investment in irrigation enterprises was \$328,000,000. A special Census of Agriculture shows 141,577 farms in 1945 with acreage of 35,062,627. Since 1940, due to "war boom" conditions, there has been a rapid increase in farm land values in California, amounting to approximately 81 percent over the past six years, and 37 percent above the levels of 1930.

California with its land area of 100,353,920 acres (18 percent greater than Illinois, Indiana and Ohio combined)—with the relatively small harvested crop acreage of under 7,000,000 mentioned above—with less than 10 percent of the State's population living on farms—produces a gross farm income nearly equal to that of Texas, a state with over four times California's crop area.

Cash farm income from crop and livestock products in California during 1945 was \$1,786,497,000 or 8.60 percent of the Nation's \$20,780,900,000 income from agriculture for that year. In the prewar year of 1940, California's total was \$672,926,000, or 8.06 percent of the Nation's \$8,343,000,000. These figures clearly indicate that California maintained and increased its position of importance in agricultural income with relation to the Nation, during the war years. Increased production due to war demands, and higher prices, raised farm incomes by more than a billion dollars annually in 1945 over 1935 levels, or more than 2½ times the prewar totals. Roughly one-third of the cash farm income is from livestock and livestock products, one-third from fruit and the remaining third from field and truck crops.

As measured by cash farm income in 1945 about one-third of the farm output is from Southern California counties, and two-thirds from the northern coun-

ties, principally from the great central valleys of the Sacramento and San Joaquin.

These high cash farm incomes are one of the factors which result in California having 125.59 percent of the national average of per capita individual incomes in 1945. Thirty-one of California's fifty-eight counties enjoy per capita individual incomes ranging from 100.73 to 194.52 percent of the Nation's average. Of these thirty-one counties, more than half are predominantly agricultural in type of industry.

Incomes from agriculture also contribute to California's percentage of 147.62 of the national average for per capita automobile and truck registrations for 1945 since all counties of the State exceed the average for the Nation.

This is likewise true of the State's 138.39 percent of the national average of per capita retail sales for 1945, since all predominantly agricultural counties far exceed the Nation's average in retail sales per capita.

Preliminary national figures for 1946 indicate that the Nation's five richest farming counties are in California with Los Angeles first, Fresno second, Tulare third, San Joaquin fourth and Kern fifth in the National Poll. California also is given seventh place—Orange County, eighth—Stanislaus County and ninth—San Bernardino County. In all, twenty-six of the Nation's one hundred richest farming counties are California counties.

California produces a greater variety of farm products commercially than any other state. This State occupies first place of all of the states of the Nation in cash farm income. In the value of crops produced, California's field, fruit and truck crops give it first rank by a wide margin, with more than 13 percent of the Nation's total. California's orchards and vineyards produce about 45 percent of the commercial fruit and nut output of the Nation, as measured by cash farm returns. The million and a half acres planted to these crops constitutes approximately 25 percent of the total harvested area of crops in the State. Of the gross income from farm products about 30 percent of the California total is derived from fruits and nuts, whereas less than 5 percent of the national total comes from these specialty crops. The State's truck farms produce about one-fourth of the vegetable crop of the Nation. From 90 to 100 percent of the country's commercial output of lemons, grapes and raisins, figs, olives, apricots, plums, almonds, walnuts, dates, artichokes and asparagus comes from California farms, and upwards of 50 percent of the oranges, avocados, peaches, pears, prunes, lettuce, spinach and cantaloupes. Over 90 percent of the United States' production of dried fruits originate in California. About 25 percent of the national output of canned fruits is packed in the State, and 25 percent of the Nation's total output of fruit for fresh consumption is contributed by California. The State produces just under one-fifth of the United States' rice crop. Cotton is now a major crop in the

southern and central part of the San Joaquin Valley. In these areas acreage yields are now more than double the average of the Southern States of the Nation. Some cotton is also produced in the Imperial, Palo Verde and Coachella Valleys. However, the extent of this crop in California is a very small part of the United States' crop, principally because of economic conditions. Since 1930 California has more than doubled its sugar beet acreage, but economic conditions here too are not favorable to any great expansion.

Rapid developments in air transportation, in quick-freezing, in dehydration, and in the increasing utiliza-

tion of plastic and other synthetic materials from farm products are expected to extend markets. The potentialities of air freight are of particular importance to California because of the advantages of this means of shipment to the State's most important agricultural crop. The demand for California fresh fruits and vegetables in Eastern and Middle Western markets can be fulfilled to a vastly greater degree than at present, when facilities are increased to deliver this plant ripened produce in greater quantities to these distant markets within a few hours of their harvesting from California fields.

TABLE 24

PRINCIPAL CROPS AND LIVESTOCK PRODUCTS OF CALIFORNIA BY COUNTIES IN ORDER OF ANNUAL VALUE—1940

Area County	Order 1st	Approximate Value 1st Product In Dollars	2nd	3rd	4th	5th	6th	7th
Area 1. San Diego	Lemons	\$2,600,000	Beef	Dairy	Eggs-Turkeys	Oranges	Flowers	*Avocados
Area 2. Los Angeles Metropolitan								
Los Angeles	*Dairy	18,100,000	Oranges	Poultry	*Nursery	Lemons	Alfalfa	Flowers
Orange	*Oranges	18,500,000	Dairy	Lemons	Beans	Beef	Eggs	Walnuts
West Riverside	Oranges	6,600,000	Beef	Lemons	Eggs-Turkeys	Dairy	Alfalfa	*Dates
Southwest San Bernardino	Oranges	13,600,000	Lemons	Dairy	Poultry	Grapes(W)	*Hogs	*Grapefruit
Area 3. Desert Imperial	*Lettuce	3,800,000	*Cantaloupes	*Carrots	Beef	Dairy	*Peas	*Flax
Area 4. Kern Kern	*Cotton	7,500,000	*Potatoes	Beef	Grapes(T)	Dairy	Sheep	Alfalfa
Area 5.								
Monterey	Lettuce	3,600,000	Sugar Beets	Beans	Dairy	Carrots	Beef	*Artichokes
San Benito	Beef	700,000	Sugar Beets	Apricots	Prunes	Tomatoes	Barley	Poultry
San Luis Obispo	Beef	2,800,000	Wheat	Dairy	Peas	Eggs	Lettuce	Cauliflower
Santa Barbara	Beef	4,800,000	Lemons	Dairy	Sugar Beets	Lettuce	Beans	*Cauliflower
Santa Cruz	*Apples	1,500,000	Lettuce	Eggs	Berries	Nursery	Dairy	Sugar Beets
Ventura	*Lemons	6,500,000	Oranges	*Beans	*Walnuts	Beef	Dairy	Sugar Beets
Area 6.								
Fresno	*Grapes(R)	11,500,000	Cotton	Dairy	Flax	Beef	*Figs	Poultry
Kings	Cotton	3,800,000	Dairy	Beef	*Barley	Grapes	Wheat	Apricots
Madera	Cotton	3,800,000	Beef	Grapes(R)	Dairy	Barley	Alfalfa	Sheep
Tulare	Oranges	13,500,000	Cotton	Grapes	*Beef	Dairy	*Olives	Peaches
Area 7.								
Area 8.								
Calaveras								
Mariposa								
Merced	Dairy	5,900,000	Beef	Barley	Eggs-Turkeys	Cotton	Figs	Grapes
San Joaquin	*Grapes(T)	6,600,000	*Asparagus	Beef	Dairy	Sugar Beets	*Tomatoes	Potatoes
Stanislaus	Dairy	4,300,000	Beans	Alfalfa	Beef	Peaches	Sheep	Grapes
Tuolumne								
Area 9. San Francisco Metropolitan								
Alameda	*Flowers	4,700,000	Dairy	Poultry	Nursery	Tomatoes	Sugar Beets	Beef
Contra Costa	Asparagus	1,000,000	Dairy	Apricots	Tomatoes	Beef	Walnuts	Poultry
Marin	Dairy	3,400,000	Beef	Poultry	Nursery	Hay	Artichokes	Peas
Napa	Dairy	800,000	Eggs	Grapes	Prunes	Lambs	Beef	Turkeys
San Francisco								
San Mateo	Flowers	2,700,000	Dairy	Hogs	Peas	Lettuce	Artichokes	*Brussel Sprouts
Santa Clara	*Prunes	4,500,000	Beef	Poultry	Dairy	*Apricots	Pears	Walnuts
Solano	Sheep	1,700,000	Asparagus	Dairy	Beef	Grain	Prunes	Pears
Sonoma	*Eggs-Hens	11,200,000	Dairy	Prunes	*Grapes(W)	*Hops	Sheep	Apples

TABLE 24—Continued

PRINCIPAL CROPS AND LIVESTOCK PRODUCTS OF CALIFORNIA BY COUNTIES IN ORDER OF ANNUAL VALUE—1940

Area County	Order 1st	Approximate Value 1st Product In Dollars	2nd	3rd	4th	5th	6th	7th
Area 10.								
Amador.....								
El Dorado.....								
Nevada.....								
Placer.....	*Plums.....	800,000	Beef.....	*Pears.....	Turkeys.....	Wheat.....	Dairy.....	Eggs-Hens
Sacramento.....	Poultry.....	3,100,000	Dairy.....	Asparagus.....	Sugar Beets.....	Tomatoes.....	Beef.....	Grapes
Sierra.....								
Sutter.....	*Peaches.....	2,700,000	Beans.....	Rice.....	Prunes.....	Dairy.....	Wheat.....	Barley
Yolo.....	*Beets.....	3,600,000	Sheep.....	Apricots.....	Tomatoes.....	Dairy.....	Barley.....	Rice
Yuba.....	Beef.....	1,000,000	Sheep.....	Peaches.....	Dairy.....	Pears.....	Beans.....	Prunes
Area 11.								
Del Norte.....								
Humboldt.....	Dairy.....	3,100,000	Sheep.....	Beef.....	Poultry.....	Hay.....	Apples.....	Walnuts
Lake.....	Pears.....	400,000	Dairy.....	Hay.....	Walnuts.....	Sheep.....	Poultry.....	Prunes
Mendocino.....	Dairy.....	1,500,000	Sheep.....	Hops.....	Grapes.....	Beef.....	Pears.....	Hay
Area 12.								
Butte.....	*Rice.....	1,000,000	Almonds.....	Beef.....	Olives.....	Sheep.....	Alfalfa.....	Hogs
Colusa.....	Rice.....	900,000	Sheep.....	Hogs.....	Sugar Beets.....	Almonds.....	Dairy.....	Wool
Glenn.....	Sheep.....	1,100,000	Dairy.....	Beef.....	Rice.....	Hogs.....	Poultry.....	Almonds
Tehama.....	*Sheep.....	1,100,000	Poultry.....	Peaches.....	Dairy.....	Beef.....	Olives.....	Barley
Area 13.								
Lassen.....	Beef.....	1,200,000	Sheep.....	Hay.....	Dairy.....	Grain.....	Poultry.....	Potatoes
Modoc.....	Beef.....	1,200,000	Potatoes.....	Barley.....	Dairy.....	Hay.....	Oats.....	Sheep
Plumas.....								
Area 14.								
Shasta.....	Beef.....	1,100,000	Dairy.....	Hogs.....	Poultry.....	Sheep.....	Grain.....	Potatoes
Siskiyou.....	Beef.....	1,000,000	Dairy.....	Sheep.....	Grain.....	Hay.....	Potatoes.....	Hogs
Trinity.....								

* Indicates that county ranks first of all counties in the State in value of product marked by asterisk.

(R) (T) and (W) indicates raisin, table or wine grapes.

Note: "Flowers" indicates cut flowers, seeds or greenhouse products. "Nursery" indicates trees, shrubs and other products. Alpine, Amador, Calaveras, Del Norte, El Dorado, Inyo, Mariposa,

Mono, Nevada, Plumas, Sierra and Trinity are largely mountainous or forest area where cattle and sheep graze; hay, potatoes, pears, and apples are chief farm products.

Source: California State Chamber of Commerce—Research Department Economic Survey Series 1941-1942, Report No. 23.

3. INDUSTRY

Industrial Growth of the West

The late war has revolutionized the old Western Economy of agriculture, mining and forestry. The West Coast has definitely outgrown its former "Colonial" or "branch office" status as an industrial dependent of the East. It has achieved industrial independence and is looking forward to the conquest of boundless new frontiers, to a continued westward surge of factories and people, and to a firmly established new era of the Pacific—a new Industrial Empire.

War born industrialization has changed the entire economic status of California. Four years have brought changes that normally would have taken twenty to fifty years. The value of California's manufactures increased to four times the 1939 output or from 2½ billion to 10½ billions dollars. Despite the fact that in 1939 this State was credited with only 4.9 percent of the value of manufactures produced throughout the Nation, Cali-

fornia undertook the production of 9.2 percent of all war manufacturing, and produced over 16 billion dollars of manufactured goods to the end of 1944—aircraft alone amounting to almost 10 billion dollars. Nearly a billion dollars has gone into ultra modern industrial plants, all rapidly converting to peacetime production of items vital to the Western Economy. It has gained key industries which guarantee its industrial independence.

America's biggest mass migration since the gold rush has added, in five years, one and three quarter million virile, energetic people to California's population. This, with a natural increase of 397,377, accounts for California's 28 percent increase in population between April, 1940 and July, 1945 (Table 25). At least two-thirds of this influx are industrial workers who have settled in the 150 industrial cities of the State. Southern California alone has absorbed half of this increase. Nor has the war's end stopped this growth

TABLE 25
AREA AND POPULATION STUDY—WESTERN ECONOMIC REGION
(Pacific and Mountain States)

	Land Area Square Miles	Population—U.S. Bureau of Census		
		1930	1940	July 1, 1945 Est.
United States.....	2,977,128	122,775,046	131,669,275	139,637,406
Mountain States				
Montana.....	146,316	537,606	559,456	509,648
Idaho.....	82,808	445,032	524,873	512,840
Wyoming.....	97,506	225,565	250,742	258,531
Colorado.....	103,967	1,035,791	1,123,296	1,161,721
New Mexico.....	121,511	423,317	531,818	540,536
Arizona.....	113,580	435,573	499,261	638,204
Utah.....	82,346	507,847	550,310	647,102
Nevada.....	109,802	91,058	110,247	148,626
Subtotal.....	857,836	3,701,789	4,150,003	4,417,208
Percent of U.S.....	28.81	3.01	3.17	3.16
Pacific States				
Washington.....	66,977	1,563,396	1,736,191	2,121,992
Oregon.....	96,350	953,786	1,089,684	1,305,988
California.....	156,803	5,677,251	6,907,387	8,866,991
California Percent of U.S.....	(5.27)	(4.62)	(5.25)	(6.35)
Subtotal.....	320,130	8,194,433	9,733,262	12,294,971
Percent of U.S.....	10.75	6.67	7.39	8.80
11 Western States				
Total.....	1,177,966	11,896,222	13,883,265	16,712,179
Percent of U.S.....	39.56	9.68	10.56	11.97

Source: Statistical Abstract of United States, 1943, and Census Report P46-3.

trend. Each month is seeing a net in-migration of at least 10,000 men, women and children. Conservative predictions indicate a California population of ten million by 1950 and twelve and half million by 1960.

Simultaneously, the Western Economic Region of eleven Pacific and Mountain States, comprising 39.56 percent of the Nation's area and containing 10.56 percent of its population in 1940, has shown a population increase in five years of 20.37 percent compared to a national increase of 6.05 percent and now contains 11.97 percent of the Nation's population (Tables 25 and 26). It forms a fast growing market for the products of this new Industrial Empire, of which California is the nucleus.

Hydroelectric power—man's cheapest and most abundant source of energy—is readily available. Boulder and Shasta dams afford a plentiful supply to California. The All-American Canal and the great Central Valley Project are opening millions of acres of new farm land and vast sources of agricultural wealth. Expanding industrial areas—the consumers of agricultural production—have encouraged expansion of rural areas in every phase of their activity. California agricultural production increased 165 percent in dollar value between 1940 and 1945 (Census of Agriculture).

The Metropolitan Aqueduct augmenting the Owens River Aqueduct furnishes abundant domestic water to Southern California's industries and populace, while the Central Valley Project similarly assures adequate supplies to Central and Northern California.

For the first time the West now has its own integrated steel industry with large plants completing the cycle from ore to pig iron to rolled and fabricated steel, the all-essential product for heavy industries.

This State produces on a commercial scale a greater number and variety of mineral substances than any other state in the Nation. In recent years the records

TABLE 26
POPULATION INCREASES—WESTERN ECONOMIC REGION
(Pacific and Mountain States)

	Population Increases		Percent
	1930-40	1940-45	1930-45
United States.....	7.2	6.05	13.73
Eleven Western States.....	16.7	20.37	40.48
Three Pacific States.....	18.8	26.73	50.10
California.....	21.7	28.37	56.19

Source: Computed from data shown in Table 25.

show that about 60 different minerals were produced under the general heading of metals, fuels, structural materials, industrial materials and salines. Mineral production in 1944 was valued at \$451,553,000 of which \$323,432,000 was accounted for by petroleum. Mountains of ores await exploitation. The State's petroleum products, in addition to being a source of power and heat for industrial purposes, in conjunction with our lumber resources have recently become a source of basic materials for the chemical and allied plastic industries. Industrial chemistry and plastics promise amazing developments from California's abundant petroleum and lumber resources. New oil cracking processes have opened up a large field of industrial development in chemicals and synthetic products, including rubber.

Light metal production too is a war-born industry of the West which now produces and refines half the Nation's aluminum and large quantities of the increas-

ingly important lighter magnesium. The industrial applications of these metals are only beginning to be appreciated. War demands have expanded the production of such metals as chromite, copper, iron ore, lead, manganese ore, quicksilver, tungsten and zinc, while gold production was shut down by government restrictions. Output of cement and other structural materials has been markedly increased, as has that of a number of industrial materials. The effect of the war has been to open up or bring transportation facilities to many mineral deposits.

Oriental trade beckons this expanding industrial empire. The West looks forward to an ever-expanding two-way commerce with a billion people in the Far East and especially to huge markets in an industrialized China. Merchant Marine and Air Routes will girdle the Pacific and link the East and the West.

TABLE 27
CALIFORNIA MANUFACTURING INDUSTRIES—AVERAGE NUMBER OF FACTORY WORKERS *

	1938	1939	1940	1941	1946	1946 Percent 1938
All Manufacturing.....	260,800	276,200	320,100	445,000	460,800	176.69
Nondurable.....	147,000	151,300	154,100	170,500	206,400	140.41
Durable.....	113,800	125,000	166,000	274,500	254,400	223.55
Lumber and Timber.....	20,800	21,500	23,500	25,500	18,500	88.94
Furniture and Wood Products.....	12,000	13,200	13,100	15,200	18,000	150.00
Iron and Steel and Their Products.....	24,100	26,900	30,600	39,000	44,200	183.40
Machinery, except electrical.....	13,200	13,300	16,400	22,000	33,800	256.06
Aircraft and Parts.....	11,800	16,800	41,200	96,100	55,700	472.03
Aircraft Percent of Total.....	4.52	6.08	12.87	21.60	12.09	
Aircraft Percent of Durable.....	10.37	13.44	24.82	35.01	21.89	

* Includes production and related workers in production and other departments, such as shipping, maintenance, and warehousing. Does not include administrative, supervisory, sales, technical, and office personnel; force-account construction workers; and

employees in government establishments (Navy yards, arsenals, etc.).

Source: California State Department of Industrial Relations—Division of Labor Statistics and Research.

TABLE 28
CALIFORNIA MANUFACTURING INDUSTRIES—TOTAL ANNUAL WAGES OF FACTORY WORKERS *
(In thousands of dollars)

	1938	1939	1940	1941	1946	1946 Percent of 1938
All Manufacturing.....	\$334,579	\$366,009	\$443,287	\$733,389	\$1,145,000	342.22
Nondurable.....	179,915	188,551	195,222	234,908	491,000	372.91
Durable.....	154,663	177,457	248,065	498,481	654,000	422.85
Lumber and Timber.....	27,564	29,407	32,360	39,862	50,000	181.40
Furniture and Wood Products.....	14,382	15,801	15,377	20,263	38,000	264.22
Iron and Steel and Their Products.....	32,350	38,253	45,221	67,589	112,000	288.84
Machinery, except electrical.....	19,715	20,816	26,785	42,681	90,000	456.51
Aircraft and Parts.....	17,402	26,404	65,587	179,681	154,000	884.96
Aircraft Percent of Total.....	5.20	7.21	14.80	24.50	13.45	
Aircraft Percent of Durable.....	11.25	14.88	26.44	36.05	23.55	

* Includes production and related workers in production and other departments, such as shipping, maintenance, and warehousing. Does not include administrative, supervisory, sales, technical, and office personnel; force-account construction workers; and

employees in government establishments (Navy yards, arsenals, etc.). Wages exclude annual bonuses.

Source: California State Department of Industrial Relations—Division of Labor Statistics and Research.

Occupations

Californians enjoy a higher standard of living than the Nation as a whole for a number of reasons:

1—The annual per capita income in California now averages about 25 percent higher than for the rest of the Nation.

2—California's expanding economy leads to more jobs and the development of an active, working, earning population.

3—By reason of heavy in-migration of persons in the prime of life, California has an unusually large proportion of its population within the active 25-55 age group.

4—War industries developed potentialities in manufacturing, which have strengthened the State's position in industrial employment.

5—As a result of better income and better employment opportunities, Californians are able to purchase and make wide use of motor vehicles and to spend leisure time in recreational activities at long distances from their homes. Residents of cities have the opportunity and the facilities to reach recreational areas in remote and even primitive regions of the State.

Three major types of employment make up the bulk of jobs in which Californians are engaged. These are:

1—Trade—24.1 percent. This includes types of jobs such as grocery clerks, department store personnel, restaurant employees, service station attendants, etc.

2—Service—20.3 percent. This includes doctors, attorneys, barbers, beauty operators, bank tellers, etc.

3—Manufacturing—20.2 percent. These are the employees in airplane plants, machine shops, canneries, bakeries, etc.

In January, 1947, the total civilian employment in California was 3,580,000. Divided into types of work, this employment was as follows:

Occupation	Gainfully employed	Percent
Agriculture, Forestry and Fishing--	353,000	9.9
Mining -----	37,000	1.0
Construction -----	170,000	4.7
Manufacturing -----	722,000	20.2
Transportation, Communications and Utilities -----	293,000	8.2
Trade -----	862,000	24.1
Service, Professions and Finance--	725,000	20.3
Government -----	418,000	11.6
Total -----	3,580,000	100.0

Source: 11th Monthly Report of Estimates and Forecasts of Civilian Employment and Unemployment in California to July, 1947.

In May, 1947 additional national figures were released which gave the 1946 California employment figure as 3,648,000 men and women. The State had a million more jobs than it had seven years ago, and was only some 100,000 jobs short of its wartime peak in 1944.

TABLE 29
CALIFORNIA BASIC INDUSTRIES—VALUE OF PRODUCTION COMPARED WITH UNITED STATES TOTALS
(In thousands of dollars)

Year	Agriculture			Mining			Total Extractive		
	U.S.	California ^a	Percent U.S.	U.S.	California ^b	Percent U.S.	U.S.	California	Percent U.S.
1900.....	\$4,832,000	\$126,000	2.61	\$828,000	\$31,585	3.81	\$5,660,000	\$157,585	2.78
1905.....	*5,312,000	160,000	3.01	1,392,000	42,457	3.05	6,704,000	202,457	3.02
1910.....	5,793,000	236,000	4.07	1,988,000	86,294	4.34	7,781,000	322,294	4.14
1915.....	6,403,000	290,000	4.53	*2,395,000	96,663	4.04	8,798,000	386,663	4.39
1920.....	12,608,000	684,000	5.43	*6,981,000	242,100	3.47	19,589,000	926,100	4.73
1925.....	10,995,000	649,000	5.90	5,678,000	434,520	7.65	16,673,000	1,083,520	6.50
1930.....	9,025,000	691,000	7.66	4,765,000	365,605	7.67	13,790,000	1,056,605	7.66
1935.....	7,086,000	582,000	8.21	3,650,000	263,404	7.22	10,736,000	845,404	7.87
1940.....	8,343,000	672,926	8.07	5,582,500	342,826	6.14	13,925,500	1,015,752	7.29
1945.....	20,781,000	1,786,497	8.60	8,067,000	473,662	5.87	28,848,000	2,260,159	7.83

Source: United States totals—Statistical Abstract of United States.

^a United States Bureau of Agricultural Economics.

^b California State Division of Mines.

^d World Almanac, 1947.

* Unofficial estimate.

TABLE 29—Continued
 CALIFORNIA BASIC INDUSTRIES—VALUE OF PRODUCTION COMPARED WITH UNITED STATES TOTALS
 (In thousands of dollars)

Year	Manufacturing			Extractive and Manufacturing			Lumbering†	Fisheries†
	U.S.	California *	Percent U.S.	U.S.	California	Percent U.S.	California	California
1900.....	\$11,032,951	\$257,386	2.33	\$16,692,951	\$414,971	2.49	-----	-----
1905.....	14,252,961	367,219	2.58	20,956,961	569,676	2.72	\$20,098	-----
1910.....	19,945,249	529,761	2.66	27,726,249	852,054	3.07	24,513	\$2,000
1915.....	23,442,692	712,801	3.04	32,240,692	1,099,464	3.41	19,685	2,506
1920.....	59,964,027	1,981,205	3.30	79,553,027	2,907,305	3.65	70,291	10,500
1925.....	60,809,225	2,442,952	4.02	77,482,225	3,526,472	4.55	72,815	11,662
1930.....	67,994,041	2,950,053	4.34	81,784,041	4,006,658	4.90	46,525	12,473
1935.....	44,993,699	2,141,990	4.76	55,729,699	2,987,394	5.36	37,444	14,683
1940.....	56,843,025	2,798,180	4.92	70,768,525	3,813,932	5.39	66,400	20,160

Source: United States totals—Statistical Abstract of United States.

* United States Census of Manufactures.

† United States figures not available.

4. COMMERCE

The first needs of people are food, clothing and shelter. Primary industries are those industries engaged in the production of such essentials, extracting from natural resources of land and water, the agricultural, mineral, forest and fishery products to be converted and processed into finished goods for consumption, which furnish the actual wealth, year after year, of the State or Nation.

These industries furnish the tangible products for exchange which are the supporting economic base for our trade and commerce.

A relatively high percentage of the working population of California is engaged in the distribution and service industries; however, the majority of its people depend for their livelihood on production, processing, transporting, financing, selling, or some other useful service in delivering these primary industry products to their eventual consumers.

The surplus of these farm, mine, forest, petroleum and factory products, exportable to other parts of the Nation or the world, brings the annual flow of new wealth to the people of California, and raises their standard of living. The State is rich in natural resources and has a firm economic foundation of basic industries, which has long supported a rapidly growing population, with high incomes and living standards.

Since the opening of the Panama Canal in 1914, and with the growth of world commerce in the years following World War I, water-borne commerce at California harbors has shown rapid growth. Through a combination of the development of industry, commerce and agriculture in the State, California harbors have expanded their foreign commerce to a tremendous degree in the past thirty years. In the period 1921 to 1940, volume of foreign commerce tonnage through San Francisco and Los Angeles harbors increased from 3,155,177 tons to 9,845,436, ranking California second to New York. (Commercial Statistics, Water-borne

Commerce of the U. S., Part 2, Annual Report of Chief of Engineers, U. S. Army). For the year 1941, value of water-borne exports through California ports—Los Angeles, San Diego and San Francisco—totalled \$271,242,667 and imports, \$235,373,373 (U. S. Department of Commerce, December, 1941). In 1946 exports through these three ports totalled \$401,000,000 and imports \$264,900,000 (U. S. Department of Commerce, Bureau of the Census, U. S. Foreign Trade Water-borne Trade by United States Ports, January-December, 1946, Summary Report FT972).

A comparison of water and air-borne commerce through California ports in 1940 is shown in Table 85 in the Air Cargo section of Part V Aeronautical Projections, of this report. While the relationship of air to water-borne commerce through California ports, by weight, may seem infinitesimal, it is significant that the relative value in dollars of air to water-borne commerce through those same ports varies from one to six percent, indicating, as might be expected, the high value and low weight of air shipments.

California's leading exports are first, petroleum, and second, agricultural products, raw and processed. The State's imports are first, manufactured iron and steel products, and second, lumber, shingles and lath, and third, automobiles. In petroleum exports the importance of water carrier is clear; in the agricultural products, both raw and processed, rail and air media is indicated. In the raw agricultural field particularly, expansion of air transport can open new markets. The State's imports are principally from within the Nation, manufactured iron and steel products and automobiles through the medium of rail transportation and lumber and lumber products by rail and water carrier.

The trend of industrial development to the west and the advantages of climate, raw materials, low-cost power, and growing markets at home and abroad favor expansion of economic productivity. The progress in the

development of air transport is of infinite value to the advancement of California and Pacific Coast commerce. The potentialities of new trade—water and air-borne commerce—through Pacific Coast ports are limitless.

The Americas alone, with twenty-one nations, and 250,000,000 people, furnish the greatest potential market in the world.

On the western rim of the Pacific lie undeveloped markets for American goods which may change the whole course of human destiny, and California and the Pacific Coast area, through its strategic position at the Pacific gateway, may once again become America's frontier.

With the growth of the markets of California and the west, the available foreign markets through the Pacific Coast gateways, the State and the entire west seems destined for an unprecedented economic growth following World War II. California and the Pacific Coast section of the country can blaze the trail for the rest of the United States to a new era of economic productivity which will insure to the American people a steadily rising tide of prosperity in the years to come.

The aeronautical importance of this potential foreign commerce is treated in more detail in Part V—Aeronautical Projections.

TABLE 30
SUMMARY OF WATER-BORNE COMMERCE IN THE PACIFIC COAST STATES, 1940
(Tons of 2,000 pounds)

	Foreign		Domestic		Total		Grand Total
	Imports	Exports	Imports	Exports	Ocean	Local	
By States							
Ports							
California.....	1,450,791	10,112,035	20,504,704	26,942,031	59,009,561	8,658,811	67,668,372
Oregon.....	95,735	665,001	3,572,142	2,092,315	6,425,193	6,385,309	12,810,502
Washington.....	1,386,736	1,571,708	6,408,847	6,151,096	15,518,387	12,094,914	27,613,301
Total.....	2,933,262	12,348,744	30,485,693	35,185,442	80,953,141	27,139,034	108,092,175
California percent of Pacific States Total.....	49.5	81.9	67.3	76.6	72.9	31.9	62.6
Gross Total, Atlantic, Gulf and Pacific Ports.....	40,740,426	49,567,568	149,771,553	164,086,602	404,166,149	205,087,879	609,254,028
Pacific Coast percent of Gross Total-Atlantic, Gulf and Pacific Ports.....	7.2	24.9	30.3	21.4	20.0	13.2	17.7
California percent of Gross Total-Atlantic, Gulf and Pacific Ports.....	3.6	20.4	13.7	16.4	14.6	4.2	11.1
Rivers							
California.....			142,512	129,204	271,716	1,783,727	2,055,443
Oregon.....	8,004	8,910	9,733	282,885	309,532	25,824,818	26,134,350
Washington.....		1,462	204,703	529,227	735,392	4,504,543	5,239,935
Total.....	8,004	10,372	356,948	941,316	1,316,640	32,113,088	33,429,728
Total, U.S. Rivers.....							196,339,069
Pacific States percent of Rivers Total.....							17.0
California percent of Pacific States Total of U.S. Rivers.....			39.9	13.7	20.6	5.5	6.1
By Areas—Ports and Rivers							
Los Angeles-Long Beach.....	687,021	5,516,493	5,797,278	9,755,469	21,756,261		21,756,261
San Francisco Bay.....	694,853	2,947,069	12,891,260	6,026,916	22,560,098	8,272,193	30,832,291
California Subtotal.....	1,381,874	8,463,562	18,688,538	15,782,385	44,316,359	8,272,193	52,588,552
Columbia River.....	96,067	776,448	3,584,549	1,902,141	6,359,205	9,055,142	15,414,347
Puget Sound.....	1,386,100	1,174,200	6,039,229	5,121,561	13,721,090	8,359,430	22,080,520
All Other.....	77,225	1,945,906	2,530,325	13,330,671	17,874,127	33,565,357	51,439,484
Total.....	2,941,266	12,360,116	30,842,641	36,126,758	82,270,781	59,252,122	141,522,903
California percent of Total By Areas—Ports and Rivers.....	47.0	68.5	60.6	43.7	53.9	14.0	37.2

Source: Compiled from "Annual Report, Chief of Engineers, United States Army, 1941."

5. HUMAN FACTORS

Population

In order to appraise properly the opportunities a region offers as a market, as a basis for industrial development, as a source of labor supply, or even as a means of livelihood to an individual, we must know not only how many people live in the region, but also where they live and something about what sort of people they are.

A knowledge of the distribution and density of population is important in plant location, in the conduct of sales campaigns, in the establishment of trade outlets, in the directing of real estate activities, and in the determination of the requirements for public utilities, highways, aviation and airways. This information is important to all business, including aviation, since the rancher, the farmer, industrialist, professional and leisure classes will demand quite different types of goods and services.

The Distribution of Population Map in this section indicates how the greater part of the population of California is clustered in relatively small areas of concentration, particularly around Los Angeles, San Francisco and in the Central Valley. This distribution has been influenced by a complex of factors including climate, topography, the distribution and the discovery of natural resources, the availability and development of water resources, the growth of industry and the development of all types of transportation. Political boundaries such as counties are not necessarily economic boundaries and are in fact rather poor lines of demarcation for economic studies, which is one of the reasons Aviation Areas are established in this report, since by this treatment a more specific application of the population factor may be obtained.

Water resources have been and will continue to be a major factor in the distribution of population in the State. The water available for irrigation is being more and more efficiently and fully utilized.

The center of population in the State has moved steadily southward from the vicinity of Stockton in the Central Valley in 1880 to Los Angeles from 1930 to the present time.

Reference to the Population Density Increase Table in this section will show a population density increase for the State from a population of .59 per square mile in 1850 to 44.1 in 1940, a figure exactly equal to the national population density.

As to what sort of people they are, their interests and occupations—in 1940, 71 percent of the population of the State lived in urban dwellings, 19.8 in rural non-farm dwellings and 9.2 on rural farms.

Population Growth

For eighty years after white men entered California there was little increase in population. As a matter of fact, if accurate information regarding the number of Indians were available, we might find that in 1840 California had fewer inhabitants than in 1770.

The discovery of gold quickly changed both the number and types of people in the State. Hordes of Americans and adventurers from all over the world swarmed into San Francisco and the Sierra mining areas. Spanish residents of the great ranchos and pueblos in the South were sadly outnumbered; the Indian practically disappeared.

Slowed down for a time during the Civil War, the influx of home seekers was revived by operation of the first transcontinental railroad. In the 1880's and '90's California experienced great land booms which, together with low fares offered by competing railroads, attracted hundreds of thousands of new people. The chart "California's Rank in Population" in this section gives a clear picture of this population growth, moving the State from 29th place of all states of the Nation in 1850 to 6th place in 1930. By 1940 California have moved to 5th place and from 1944 to the present has ranked 3rd in population of the forty-eight states. The State also showed the largest numerical increase and percentage of increase in population of all states for the period 1900 to 1944.

After World War I, a movement to California began which constitutes one of the greatest human migrations of all time. More than 400,000 new residents entered the State in 1923 alone. The migration into California prior to 1930 has been greater in volume than similar movements to any other State in the Nation. California gained approximately 2¼ million persons during the 1920-30 decade, about 1¼ million during the 1930-40 decade, and a net gain of civilian population by migration of 1,639,824 in the period 1940 to 1946. During this same 1940 to 1946 period the net United States gain for all states was 594,109, indicating the large migration to California from other states within the nation. About one out of every five persons living in California now, arrived since 1940. (Statistical Abstract of U. S.; U. S. Census Report).

The flood tide of immigration continues and there seems to be no immediate prospect of its cessation. The movement has gained in volume since the beginning of the defense program and is continuing through the present postwar period. The large increases in population of the State to which we have become accustomed would naturally be expected to continue through migration

as industrial development dictates. As a result of the war, the whole industrial base of the State is being expanded and broadened. This new base is an important part of the necessary foundation for future development and population increases. It is probable that the population of California and the western part of

the United States will continue to grow faster than the population of the Nation as a whole. Recent population growth trends of the eleven Western States, Table 26, indicate a population growth about three times the national rate of increase, while for California the rate increase is four times the national average.

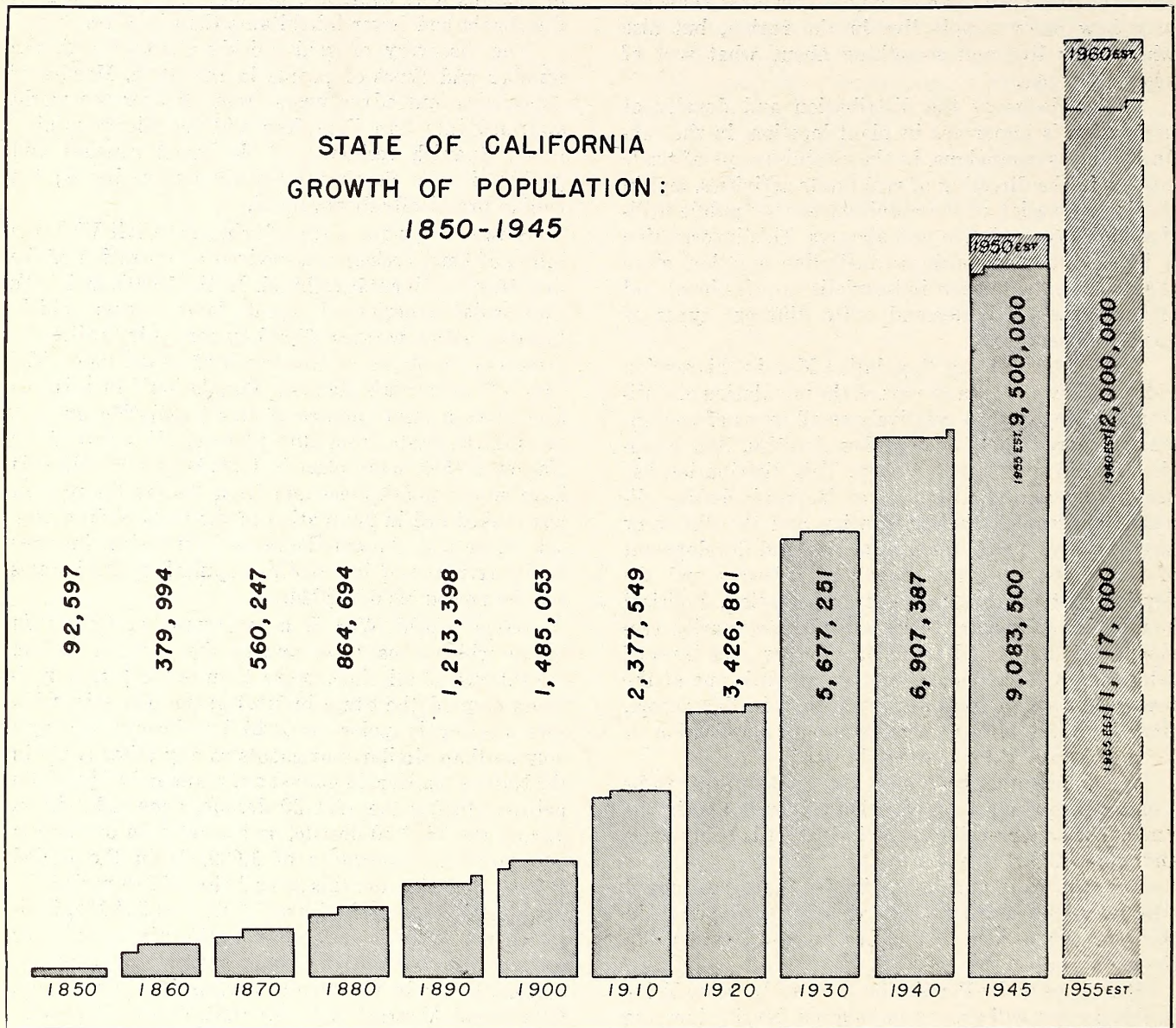


FIGURE 2

CALIFORNIA AIRPORTS

73

TABLE 31
CALIFORNIA'S RANK IN POPULATION BASED ON UNITED STATES CENSUS—1850-1945

	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1945
U.S.	23,191,876	31,443,321	38,558,371	50,155,783	62,947,714	75,994,575	91,972,266	105,710,620	122,775,046	131,669,275	139,637,406
1 New York	New York 3,097,394	New York 3,880,735	New York 4,382,759	New York 5,082,871	New York 6,003,174	New York 7,268,894	New York 9,113,614	New York 10,385,227	New York 12,588,066	New York 13,479,142	New York 13,631,321
2 Pennsylvania	Pennsylvania 2,311,786	Pennsylvania 2,906,215	Pennsylvania 3,521,951	Pennsylvania 4,282,891	Pennsylvania 5,258,113	Pennsylvania 6,302,115	Pennsylvania 7,665,111	Pennsylvania 8,720,017	Pennsylvania 9,631,350	Pennsylvania 9,900,180	Pennsylvania 10,176,212
3 Ohio	Ohio 1,980,329	Ohio 2,339,511	Ohio 2,665,260	Ohio 3,198,062	Illinois 3,826,352	Illinois 4,821,550	Illinois 5,638,591	Illinois 6,485,280	Illinois 7,630,654	Illinois 7,897,241	CALIFORNIA 8,866,991
4 Virginia	Illinois 1,421,661	Illinois 1,711,951	Illinois 2,539,891	Illinois 3,077,871	Ohio 3,672,329	Ohio 4,157,545	Ohio 4,767,121	Ohio 5,759,394	Ohio 6,646,697	Ohio 6,907,612	Illinois 8,286,637
5 Tennessee	Virginia 1,002,717	Virginia 1,596,318	Missouri 1,721,295	Missouri 2,168,380	Missouri 2,879,185	Missouri 3,106,665	Texas 3,896,542	Texas 4,663,228	Texas 5,824,715	CALIFORNIA 6,907,387	Texas 6,941,022
6 Massachusetts	Indiana 994,514	Indiana 1,350,428	Indiana 1,680,637	Indiana 1,978,301	Massachusetts 2,238,947	Texas 3,048,710	Massachusetts 3,366,416	Massachusetts 3,852,356	CALIFORNIA 5,677,251	Texas 6,414,824	Ohio 6,495,493
7 Indiana	Massachusetts 988,416	Massachusetts 1,231,066	Massachusetts 1,467,351	Massachusetts 1,783,085	Texas 2,235,527	Massachusetts 2,805,346	Missouri 3,293,335	Michigan 3,668,412	Michigan 4,842,325	Michigan 5,256,106	Michigan 5,927,582
8 Kentucky	Missouri 982,405	Missouri 1,182,012	Kentucky 1,321,011	Kentucky 1,648,690	Indiana 2,192,404	Indiana 2,516,462	Michigan 2,810,173	CALIFORNIA 3,426,861	Massachusetts 4,249,614	Massachusetts 4,316,721	New Jersey 4,528,417
9 Georgia	Kentucky 906,185	Kentucky 1,155,684	Tennessee 1,258,520	Michigan 1,636,937	Michigan 2,099,890	Michigan 2,420,982	Indiana 2,700,876	Missouri 3,404,055	New Jersey 4,041,334	New Jersey 4,160,165	Massachusetts 4,501,555
10 N. Carolina	Tennessee 869,039	Tennessee 1,109,801	Virginia 1,225,163	Iowa 1,624,615	Iowa 1,912,297	Iowa 2,231,853	Georgia 2,609,121	New Jersey 3,155,900	Missouri 3,629,367	Missouri 3,784,664	Missouri 3,804,733
11 Illinois	Georgia 851,470	Georgia 1,057,288	Iowa 1,194,020	Texas 1,591,749	Kentucky 1,858,635	Georgia 2,216,331	New Jersey 2,537,167	Indiana 2,930,390	Indiana 3,238,503	N. Carolina 3,571,623	Indiana 3,692,046
12 Alabama	N. Carolina 771,623	N. Carolina 992,622	Georgia 1,184,109	Tennessee 1,542,359	Georgia 1,837,353	Kentucky 2,147,174	CALIFORNIA 2,377,549	Georgia 2,895,832	N. Carolina 3,170,276	Indiana 3,427,796	N. Carolina 3,626,613
13 Missouri	Alabama 682,044	Alabama 964,201	Michigan 1,184,059	Georgia 1,542,180	Tennessee 1,767,518	Wisconsin 2,069,042	Wisconsin 2,333,800	Wisconsin 2,632,067	Wisconsin 2,939,006	Wisconsin 3,137,587	Georgia 3,241,516
14 S. Carolina	Mississippi 668,507	Mississippi 791,305	N. Carolina 1,071,361	Virginia 1,512,565	Wisconsin 1,699,330	Tennessee 2,020,616	Kentucky 2,289,905	N. Carolina 2,559,123	Georgia 2,908,506	Georgia 3,123,723	Wisconsin 3,181,335
15 Mississippi	Wisconsin 609,526	Wisconsin 775,881	Wisconsin 1,054,670	N. Carolina 1,399,750	Virginia 1,655,980	N. Carolina 1,893,810	Iowa 2,224,771	Kentucky 2,416,630	Alabama 2,546,248	Tennessee 2,915,841	Tennessee 3,091,148
16 Maine	Michigan 583,169	Michigan 749,113	Alabama 996,992	Wisconsin 1,315,497	N. Carolina 1,617,949	New Jersey 1,883,669	N. Carolina 2,206,287	Iowa 2,404,021	Tennessee 2,616,556	Kentucky 2,846,627	Virginia 3,054,565
17 Maryland	Louisiana 583,034	Louisiana 708,002	New Jersey 906,096	Alabama 1,262,505	Alabama 1,513,401	Virginia 1,854,184	Tennessee 2,184,789	Minnesota 2,387,125	Kentucky 2,614,589	Alabama 2,832,961	Alabama 2,968,536
18 Louisiana	S. Carolina 517,752	S. Carolina 703,708	Mississippi 827,922	Mississippi 1,131,597	New Jersey 1,444,933	Alabama 1,828,697	Alabama 2,138,093	Alabama 2,348,174	Minnesota 2,563,953	Minnesota 2,792,300	Kentucky 2,751,246
19 New Jersey	Maryland 489,555	Maryland 687,049	Texas 818,579	New Jersey 1,131,116	Kansas 1,428,108	Minnesota 1,751,394	Minnesota 2,075,708	Tennessee 2,337,885	Iowa 2,470,939	Virginia 2,677,773	Minnesota 2,726,998
20 Michigan	Iowa 397,654	Iowa 674,913	Maryland 780,894	Kansas 996,096	Minnesota 1,310,283	Mississippi 1,561,270	Virginia 2,061,612	Virginia 2,309,187	Virginia 2,421,851	Iowa 2,538,268	Louisiana 2,555,547
21 Connecticut	New Jersey 370,792	New Jersey 672,035	Louisiana 726,915	S. Carolina 995,577	Mississippi 1,289,600	CALIFORNIA 1,485,053	Mississippi 1,797,114	Oklahoma 2,028,283	Oklahoma 2,396,040	Louisiana 2,363,880	Iowa 2,431,533
22 N. Hampshire	Maine 317,976	Maine 628,279	S. Carolina 705,606	Louisiana 939,946	CALIFORNIA 1,213,398	Kansas 1,470,495	Kansas 1,690,949	Louisiana 1,798,509	Louisiana 2,101,593	Oklahoma 2,336,434	Florida 2,241,944
23 Vermont	Texas 314,120	Texas 604,215	Maine 626,915	Maryland 934,943	S. Carolina 1,151,149	Louisiana 1,381,625	Oklahoma 1,657,155	Mississippi 1,790,618	Mississippi 2,009,821	Mississippi 2,183,796	Maryland 2,200,458
24 Wisconsin	Connecticut 305,391	Connecticut 460,147	CALIFORNIA 580,247	CALIFORNIA 864,694	Arkansas 1,128,211	S. Carolina 1,340,316	Louisiana 1,556,388	Kansas 1,769,257	Kansas 1,880,999	Arkansas 1,949,357	Mississippi 2,166,339
25 Texas	Arkansas 212,592	Arkansas 435,450	Connecticut 537,454	Arkansas 802,625	Louisiana 1,118,588	Arkansas 1,311,564	Arkansas 1,574,449	Arkansas 1,752,204	Arkansas 1,854,482	W. Virginia 1,901,974	Oklahoma 2,147,292
26 Arkansas	CALIFORNIA 209,897	CALIFORNIA 379,994	Arkansas 484,471	Minnesota 780,773	Nebraska 1,062,656	Maryland 1,188,044	S. Carolina 1,515,400	S. Carolina 1,683,724	S. Carolina 1,738,765	S. Carolina 1,899,804	Washington 2,121,992
27 Iowa	N. Hampshire 192,214	N. Hampshire 326,073	W. Virginia 442,014	Maine 648,936	Maryland 1,042,390	Nebraska 1,066,300	Maryland 1,295,346	W. Virginia 1,463,701	W. Virginia 1,729,205	Florida 1,897,414	S. Carolina 1,948,327
28 Rhode Island	Vermont 147,545	Vermont 315,098	Minnesota 439,706	Connecticut 622,700	W. Virginia 762,794	W. Virginia 958,800	W. Virginia 1,221,119	Maryland 1,449,661	Maryland 1,631,526	Maryland 1,821,244	Connecticut 1,939,956
29 CALIFORNIA	Rhode Island 92,597	Rhode Island 174,620	Kansas 364,399	W. Virginia 618,457	Connecticut 746,258	Connecticut 908,420	Nebraska 1,192,214	Connecticut 1,380,631	Connecticut 1,606,903	Kansas 1,801,028	W. Virginia 1,901,591
30 Delaware	Minnesota 91,532	Minnesota 172,023	Vermont 330,551	Nebraska 452,402	Maine 661,086	Oklahoma 790,391	Washington 1,141,990	Washington 1,356,621	Washington 1,583,396	Washington 1,736,191	Arkansas 1,876,042

CALIFORNIA AIRPORTS

TABLE 32
CALIFORNIA POPULATION IN GROUPS OF PLACES CLASSIFIED AS TO SIZE, URBAN AND RURAL
1920 TO LATEST CENSUS

Class		1940 or Special Census	Decennial Census		
			1940	1930	1920
Urban Territory					
Places of 100,000 or more.....	Number.....	7	6	5	3
	Population.....	3,857,797	2,914,546	2,446,532	1,299,610
Places of 25,000 to 100,000.....	Number.....	23	20	16	9
	Population.....	1,208,407	921,072	764,609	451,082
Places of 10,000 to 25,000.....	Number.....	52	34	28	13
	Population.....	751,959	476,485	409,460	201,832
Places of 5,000 to 10,000.....	Number.....	52	51	48	26
	Population.....	377,382	385,575	342,421	171,802
Places of 2,500 to 5,000.....	Number.....	46	56	58	56
	Population.....	162,218	204,587	197,574	202,633
Subtotal—Urban Places.....	Number.....	180	167	155	107
	Population.....	6,357,763	4,902,265	4,160,596	2,326,959
Rural Territory					
Incorporated Places of 1,000 to 2,500.....	Number.....	77	81	77	77
	Population.....	130,128	132,213	123,864	128,563
Incorporated Places under 1,000.....	Number.....	36	38	48	69
	Population.....	22,616	23,564	30,420	45,114
Subtotal, incorporated Places.....	Number.....	113	119	125	146
	Population.....	152,744	155,777	154,284	173,677
Unincorporated Territory.....	Population.....	2,824,488	1,849,345	1,362,371	926,225
Subtotal, Rural Territory.....	Population.....	2,977,237	2,005,122	1,516,655	1,099,902
Grand total, State.....	Population.....	*9,335,000	6,907,387	5,677,251	3,426,861

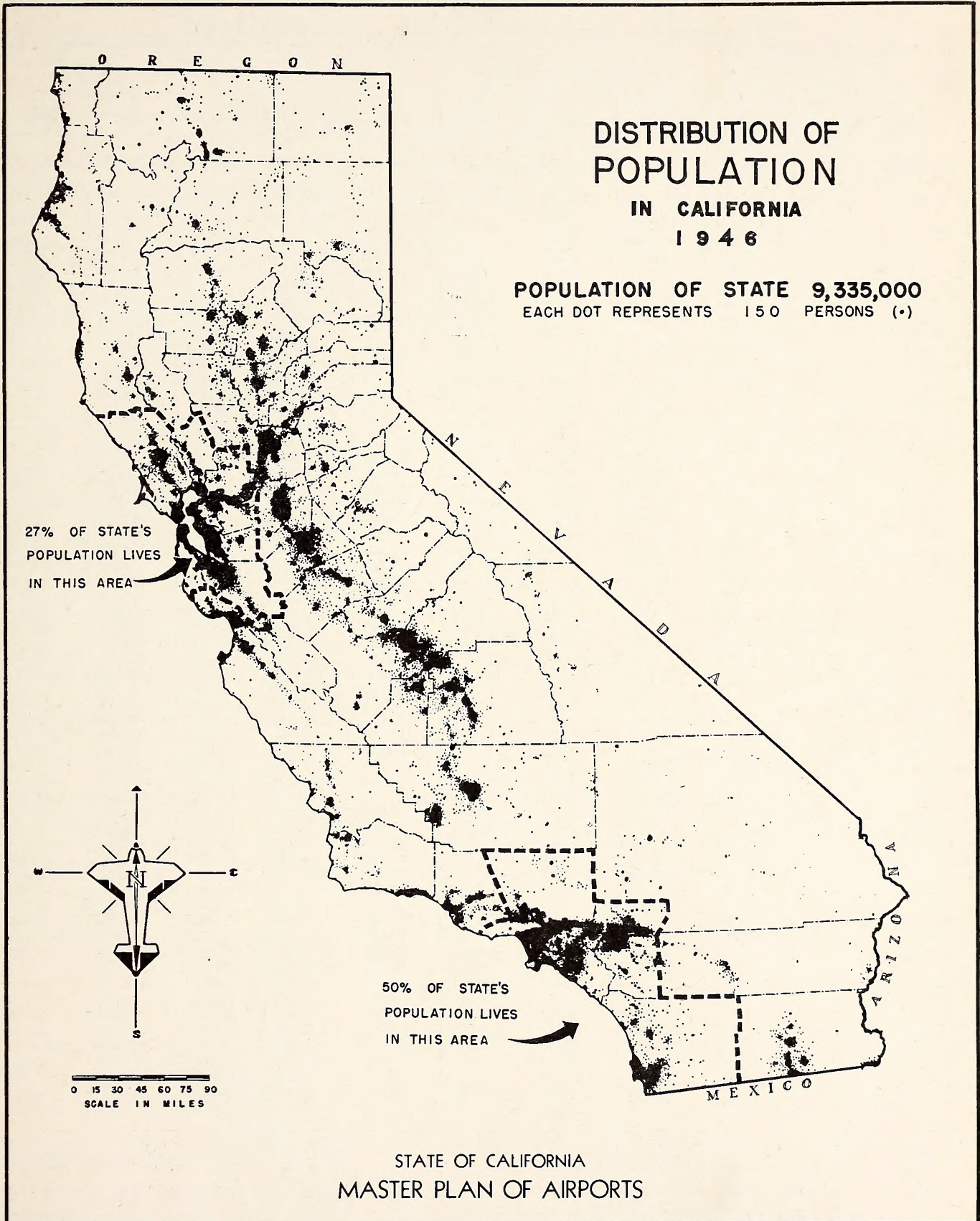
* Estimates—Table 63.

TABLE 33
POPULATION DENSITY INCREASE

Census Records	California				United States			
	Popula- tion	Percent Increase Period	Land Area, Square Miles	Population per Square Mile	Popula- tion	Percent Increase Period	Land Area, Square Miles	Population per Square Mile
1850.....	92,597		155,900	.59	23,191,876	35.9	2,944,337	7.9
1860.....	379,994	310.4	155,900	2.4	31,443,321	35.6	2,973,965	10.6
1870.....	560,247	47.4	155,900	3.6	39,818,440	26.6	2,973,965	13.4
1880.....	864,694	54.3	155,900	5.5	50,155,783	26.0	2,973,965	16.9
1890.....	1,213,398	40.3	155,900	7.8	62,947,714	25.5	2,973,965	21.2
1900.....	1,485,053	22.4	156,092	9.5	75,994,575	20.7	2,974,159	25.6
1910.....	2,377,549	60.1	155,652	15.3	91,072,266	21.0	2,973,890	30.9
1920.....	3,426,861	44.1	155,652	22.0	105,710,620	14.9	2,973,776	35.5
1930.....	5,677,251	65.7	156,803	36.2	122,775,046	16.1	2,977,128	41.2
1940.....	6,907,387	21.7	156,803	44.1	131,669,275	7.2	2,977,128	44.2
Estimates								
1945.....	9,083,500	*31.5	156,803	57.9	139,637,406	*6.1	2,977,128	46.9
1950.....	9,935,000	*9.4	156,803	63.4	145,500,000	*4.2	2,977,128	48.9
1955.....	11,117,500	*11.9	156,803	70.9	150,000,000	*3.1	2,977,128	50.4

* Increase for five-year period since previous date.
Source: Through 1940 United States Bureau of Census-
Statistical Abstract of United States, 1943 Edition.
For United States, 1945 United States Bureau of
Census-Population Estimates 7-1-45. Report
P46-3.

For California, 1945 California Tax Digest.
For United States, 1950 and 1955 United States
Bureau of Census Estimates for United States
Report P46-7.
For California, 1950 and 1955 Mean of Estimates of
State Reconstruction and Reemployment Commis-
sion for California.



CALIFORNIA AIRPORTS

TABLE 34
CALIFORNIA POPULATION BY COUNTIES WITH PROJECTIONS TO 1955

	United States Decennial Census					Estimates			
	1900	1910	1920	1930	1940	July 1, 1945	July 1, 1946	1950	1955
United States.....	75,994,575	91,972,266	105,710,620	122,775,046	131,669,275	139,637,406	141,000,000	145,500,000	150,000,000
California.....	1,485,053	2,377,549	3,426,861	5,677,251	6,907,387	9,083,500	9,335,000	9,935,000	11,117,500
Alameda.....	130,197	246,131	344,177	474,883	513,011	739,000	721,500	767,500	837,000
Alpine.....	509	309	243	241	323	250	285	270	298
Amador.....	11,116	9,086	7,793	8,494	8,973	7,450	8,200	8,150	9,025
Butte.....	17,117	27,301	30,030	34,093	42,840	50,050	53,100	58,000	66,250
Calaveras.....	11,200	9,171	6,183	6,008	8,221	8,450	9,450	9,700	10,850
Colusa.....	7,364	7,732	9,290	10,258	9,788	9,700	10,000	10,550	11,400
Contra Costa.....	18,046	31,674	53,889	78,608	100,450	264,500	278,500	265,000	290,000
Del Norte.....	2,408	2,417	2,759	4,739	4,745	3,850	5,100	4,150	4,350
El Dorado.....	8,986	7,492	6,426	8,325	13,229	13,550	14,850	14,950	16,650
Fresno.....	37,862	75,657	128,779	144,379	178,565	216,000	237,500	240,200	270,600
Glenn.....	5,150	7,172	11,853	10,935	12,195	14,200	15,350	17,000	19,375
Humboldt.....	27,104	33,857	37,413	43,233	45,812	52,200	51,950	52,600	55,650
Imperial.....	c	13,591	43,453	60,903	59,740	55,600	56,700	59,750	67,950
Inyo.....	4,377	6,974	7,031	6,555	7,625	9,500	9,800	10,155	11,240
Kern.....	16,480	37,715	54,843	82,570	135,124	179,000	192,000	197,400	222,700
Kings.....	9,871	16,230	22,031	25,385	35,168	40,800	44,400	45,700	51,450
Lake.....	6,017	5,526	5,402	7,166	8,069	9,500	10,750	10,500	11,000
Lassen.....	4,511	4,802	8,507	12,589	14,479	18,750	19,000	19,350	21,300
Los Angeles.....	170,298	504,131	936,455	2,208,492	2,785,643	3,533,500	3,597,500	3,921,850	4,444,075
Madera.....	6,364	8,368	12,203	17,164	23,314	29,550	32,500	32,750	36,750
Marin.....	15,702	25,114	27,342	41,648	52,907	77,150	75,600	80,500	87,000
Mariposa.....	4,720	3,956	2,775	3,233	5,605	4,050	4,300	4,400	4,950
Mendocino.....	20,465	23,929	24,116	23,505	27,864	30,750	33,450	33,150	35,550
Merced.....	9,215	15,148	24,579	36,748	46,988	52,350	55,550	57,400	64,700
Modoc.....	5,076	6,191	5,425	8,038	8,713	9,600	9,650	10,550	11,775
Mono.....	2,167	2,042	960	1,360	2,299	1,250	1,400	1,275	1,437
Monterey.....	19,380	24,146	27,980	53,705	73,032	97,200	103,000	106,500	120,500
Napa.....	16,451	19,800	20,678	22,897	28,503	42,700	42,700	45,250	49,875
Nevada.....	17,789	14,955	10,850	10,596	19,283	17,150	19,400	19,250	21,500
Orange.....	19,696	34,436	61,375	118,674	130,760	167,500	170,700	186,750	211,350
Placer.....	15,786	18,237	18,584	24,468	28,108	30,850	33,250	33,500	37,375
Plumas.....	4,657	5,259	5,681	7,913	11,548	10,700	11,500	10,900	12,075
Riverside.....	17,897	34,696	50,297	81,024	105,524	134,300	144,500	148,750	168,500
Sacramento.....	45,915	67,806	91,029	141,999	170,333	212,500	224,000	231,000	256,750
San Benito.....	6,633	8,041	8,995	11,311	11,392	12,950	14,450	13,700	15,600
San Bernardino.....	27,929	56,706	73,401	133,900	161,108	223,700	242,000	243,500	275,625
San Diego.....	35,090	61,665	112,248	209,659	289,348	474,500	470,500	514,900	581,000
San Francisco.....	342,782	416,912	506,676	634,394	634,536	775,000	775,000	838,250	898,375
San Joaquin.....	35,452	50,731	79,905	102,940	134,207	184,500	192,000	203,550	229,275
San Luis Obispo.....	16,637	19,383	21,893	29,613	33,246	44,350	47,000	47,800	53,900
San Mateo.....	12,094	26,585	36,781	77,405	111,782	178,000	179,000	198,150	226,575
Santa Barbara.....	18,934	27,738	41,097	65,167	70,555	84,250	87,700	95,500	107,500
Santa Clara.....	60,216	83,539	100,676	145,118	174,949	224,000	236,000	242,000	264,500
Santa Cruz.....	21,512	26,140	26,269	37,453	45,057	51,500	58,000	58,950	66,700
Shasta.....	17,318	18,920	13,361	13,927	28,800	25,650	29,450	27,750	32,525
Sierra.....	4,017	4,098	1,783	2,422	3,025	2,375	2,490	2,550	2,800
Siskiyou.....	16,962	18,801	18,545	25,480	28,598	28,250	29,400	29,500	32,725
Solano.....	24,143	27,559	40,602	40,834	49,118	119,000	119,750	127,500	140,000
Sonoma.....	38,480	48,394	52,090	62,222	69,052	83,100	87,100	90,000	98,175
Stanislaus.....	9,550	22,522	43,557	56,641	74,866	107,000	116,650	123,500	138,750
Sutter.....	5,886	6,328	10,115	14,618	18,680	22,550	24,900	27,000	31,250
Tehama.....	10,996	11,401	12,882	13,866	14,316	15,350	16,600	16,500	18,875
Trinity.....	4,383	3,301	2,551	2,809	3,970	3,125	4,075	3,350	3,550
Tulare.....	18,375	35,440	59,031	77,442	107,152	127,400	145,000	142,200	160,100
Tuolumne.....	11,166	9,979	7,768	9,271	10,887	10,150	10,950	11,300	12,650
Ventura.....	14,367	18,347	28,724	54,976	69,685	88,150	90,500	99,050	113,400
Yolo.....	13,618	13,296	17,105	23,644	27,243	33,000	34,300	37,800	43,150
Yuba.....	8,620	10,042	10,375	11,331	17,034	22,200	24,750	26,000	29,250

^a Part of Glenn County annexed to Butte County in 1915.

^b Part of Fresno County annexed to Kings County in 1909.

^c Imperial County formed from part of San Diego in 1907.

Sources: United States—July 1, 1945, Estimate from Bureau of Census Report, Series P-46, No. 3.
United States—1946-50-55 Estimates from Bureau of Census Report, Series P-46, No. 7.

California—Midyear 1945 and 1946 estimates for State and counties are midpoints of respective year and estimates of California Taxpayers Association.

California—Projections for 1950 and 1955 for State and counties are midpoints of "high" and "low" estimates of State Reconstruction and Reemployment Commission in booklet "Estimated Range for Population Growth in California."

TABLE 35
RATE OF POPULATION GROWTH—CALIFORNIA AND ITS COUNTIES—1900-1955

	Population Ratios by Census Periods							Population Ratios to 1900					
	1910	1920	1930	1940	1946 Est.	1950 Est.	1955 Est.	1920	1930	1940	1946 Est.	1950 Est.	1955 Est.
	1900	1910	1920	1930	1940	1940	1950 Est.	1900	1900	1900	1900	1900	1900
United States.....	1.21	1.15	1.16	1.07	1.07	1.11	1.03	1.39	1.62	1.73	1.86	1.91	1.97
California.....	1.60	1.44	1.66	1.22	1.35	1.44	1.12	2.31	3.82	4.65	6.29	6.69	7.49
Alameda.....	1.89	1.40	1.38	1.08	1.41	1.50	1.09	2.64	3.65	3.94	5.54	5.89	6.43
Alpine.....	.61	.79	.99	1.34	.88	.83	1.10	.48	.47	.63	.56	.53	.59
Amador.....	.82	.86	1.09	1.06	.91	.91	1.11	.70	.76	.81	.74	.73	.81
Butte.....	1.59	1.11	1.13	1.26	1.24	1.35	1.14	1.77	1.99	2.50	3.10	3.39	3.87
Calaveras.....	.82	.67	.97	1.37	1.15	1.18	1.12	.55	.54	.73	.84	.87	.97
Colusa.....	1.05	1.20	1.10	.95	1.02	1.08	1.08	1.26	1.39	1.33	1.36	1.43	1.55
Contra Costa.....	1.76	1.70	1.46	1.28	2.77	2.64	1.09	2.99	4.36	5.57	15.43	14.36	16.07
Del Norte.....	1.00	1.14	1.72	1.00	1.07	.87	1.05	1.15	1.97	1.97	2.12	1.72	1.81
El Dorado.....	.83	.86	1.30	1.59	1.12	1.13	1.11	.72	.93	1.47	1.65	1.66	1.85
Fresno.....	2.00	1.70	1.12	1.24	1.33	1.35	1.13	3.40	3.81	4.72	6.27	6.34	7.13
Glenn.....	1.39	1.65	.92	1.12	1.26	1.39	1.14	2.30	2.12	2.37	2.98	3.30	3.76
Humboldt.....	1.25	1.11	1.16	1.06	1.13	1.15	1.06	1.38	1.60	1.69	1.92	1.94	2.05
Imperial.....		3.20	1.40	.98	.95	1.00	1.14	*3.20	*4.48	*4.40	*4.17	*4.40	*5.00
Inyo.....	1.59	1.01	.93	1.16	1.29	1.33	1.11	1.61	1.50	1.74	2.24	2.32	2.57
Kern.....	2.29	1.45	1.50	1.64	1.42	1.46	1.13	3.33	5.01	8.20	11.65	11.98	13.51
Kings.....	1.64	1.36	1.15	1.39	1.26	1.30	1.13	2.23	2.57	3.56	4.50	4.03	5.21
Lake.....	.92	.98	1.33	1.13	1.33	1.30	1.05	.90	1.19	1.34	1.79	1.75	1.83
Lassen.....	1.06	1.77	1.48	1.15	1.31	1.34	1.10	1.89	2.79	3.21	4.21	4.29	4.72
Los Angeles.....	2.96	1.86	2.36	1.26	1.29	1.41	1.13	5.50	12.97	16.36	21.12	23.03	26.10
Madera.....	1.31	1.46	1.41	1.36	1.39	1.40	1.12	1.92	2.70	3.66	5.11	5.15	5.77
Marin.....	1.60	1.49	1.52	1.27	1.43	1.52	1.08	1.74	2.65	3.37	4.81	5.13	5.54
Mariposa.....	.84	.70	1.17	1.73	.77	.79	1.13	.59	.68	1.19	.91	.93	1.05
Mendocino.....	1.17	1.01	.97	1.21	1.20	1.19	1.07	1.18	1.15	1.36	1.63	1.62	1.74
Merced.....	1.64	1.62	1.50	1.28	1.18	1.22	1.13	2.67	4.00	5.10	6.03	6.23	7.02
Modoc.....	1.22	1.07	1.48	1.08	1.11	1.21	1.12	1.07	1.58	1.72	1.90	2.08	2.32
Mono.....	.94	.47	1.42	1.69	.61	.55	1.13	.44	.63	1.06	.65	.59	.66
Monterey.....	1.25	1.16	1.92	1.36	1.41	1.46	1.13	1.44	2.77	3.77	5.31	5.50	6.22
Napa.....	1.20	1.04	1.11	1.24	1.50	1.59	1.10	1.26	1.39	1.73	2.60	2.75	3.03
Nevada.....	.84	.73	.98	1.82	1.00	1.00	1.12	.61	.60	1.08	1.09	1.08	1.21
Orange.....	1.75	1.78	1.93	1.10	1.31	1.43	1.13	3.12	6.03	6.64	8.67	9.48	10.73
Placer.....	1.16	1.02	1.32	1.15	1.18	1.19	1.12	1.18	1.55	1.78	2.11	2.12	2.37
Plumas.....	1.13	1.08	1.39	1.46	1.00	.93	1.12	1.22	1.70	2.48	2.47	2.31	2.58
Riverside.....	1.94	1.45	1.61	1.30	1.37	1.41	1.13	2.81	4.53	5.90	8.07	8.31	9.41
Sacramento.....	1.48	1.34	1.56	1.20	1.32	1.36	1.11	1.98	3.09	3.71	4.88	5.03	5.59
San Benito.....	1.21	1.12	1.26	1.01	1.27	1.20	1.14	1.36	1.71	1.72	2.18	2.07	2.35
San Bernardino.....	2.03	1.29	1.82	1.20	1.50	1.50	1.14	2.63	4.79	5.77	8.66	8.66	9.84
San Diego.....	1.76	1.82	1.87	1.38	1.63	1.78	1.13	3.20	5.97	8.25	13.41	14.67	16.56
San Francisco.....	1.22	1.22	1.25	1.00	1.22	1.32	1.07	1.48	1.85	1.85	2.26	2.45	2.62
San Joaquin.....	1.43	1.58	1.29	1.30	1.43	1.52	1.13	2.25	2.90	3.78	5.42	5.74	6.47
San Luis Obispo.....	1.17	1.13	1.35	1.12	1.41	1.44	1.13	1.32	1.78	2.00	2.83	2.87	3.23
San Mateo.....	2.20	1.38	2.10	1.44	1.60	1.77	1.14	3.04	6.40	9.24	14.80	16.38	18.73
Santa Barbara.....	1.46	1.48	1.59	1.08	1.24	1.35	1.13	2.17	3.44	3.73	4.63	5.04	5.68
Santa Clara.....	1.39	1.21	1.44	1.21	1.35	1.38	1.09	1.67	2.41	2.91	3.92	4.02	4.39
Santa Cruz.....	1.22	1.00	1.42	1.20	1.29	1.31	1.13	1.04	1.74	2.09	2.70	2.74	3.10
Shasta.....	1.09	.71	1.04	2.07	1.02	.96	1.17	.77	.80	1.66	1.70	1.60	1.88
Sierra.....	1.02	.44	1.36	1.25	.82	.84	1.10	.44	.60	.75	.62	.63	.70
Siskiyou.....	1.11	.99	1.37	1.12	1.03	1.03	1.11	1.09	1.50	1.69	1.73	1.74	1.93
Solano.....	1.14	1.47	1.01	1.20	2.44	2.60	1.10	1.68	1.69	2.03	4.96	5.28	5.80
Sonoma.....	1.26	1.08	1.19	1.11	1.26	1.30	1.09	1.35	1.62	1.79	2.26	2.34	2.55
Stanislaus.....	2.36	1.93	1.30	1.32	1.56	1.65	1.12	4.56	5.93	7.84	12.21	12.93	14.53
Sutter.....	1.08	1.60	1.45	1.28	1.33	1.45	1.16	1.72	2.48	3.17	4.23	4.59	5.31
Tehama.....	1.04	1.13	1.08	1.03	1.16	1.15	1.14	1.17	1.26	1.30	1.51	1.50	1.72
Trinity.....	.75	.77	1.10	1.41	1.03	.84	1.06	.58	.64	.91	.93	.76	.81
Tulare.....	1.93	1.67	1.31	1.38	1.35	1.33	1.13	3.21	4.21	5.83	7.89	7.74	8.71
Tuolumne.....	.89	.78	1.19	1.17	1.01	1.04	1.12	.70	.83	.98	.98	1.01	1.13
Ventura.....	1.28	1.57	1.91	1.27	1.30	1.42	1.14	2.00	3.83	4.85	6.30	6.89	7.89
Yolo.....	1.02	1.23	1.38	1.15	1.26	1.39	1.14	1.26	1.74	2.00	2.52	2.78	3.17
Yuba.....	1.16	1.03	1.09	1.50	1.45	1.53	1.13	1.20	1.31	1.98	2.87	3.02	3.39

Source: Computed from populations shown in Table 34.

* Imperial County ratios on 1910 base.

Population Distribution

The distribution of population in California is very uneven. Certain areas are closely settled, but thousands of square miles of desert and mountain country are virtually uninhabited.

According to the census of 1940, more than 80 per cent of the 6,900,000 Californians live in three regions—the Los Angeles Basin (3,000,000), San Francisco Bay Area (1,500,000) and the Central Valley (1,100,000). Most of the remaining 1,300,000 are found in small coastal lowlands from San Diego to Crescent City, although the Imperial Valley and the Sierra Nevada foothills east of Sacramento and Stockton also are reasonably well populated. Elsewhere in the State scattered ranches, occasional small towns and "wide open spaces" are the rule.

TABLE 36
POPULATION DENSITY—CALIFORNIA AVIATION
AREAS AND COUNTIES
July 1, 1946

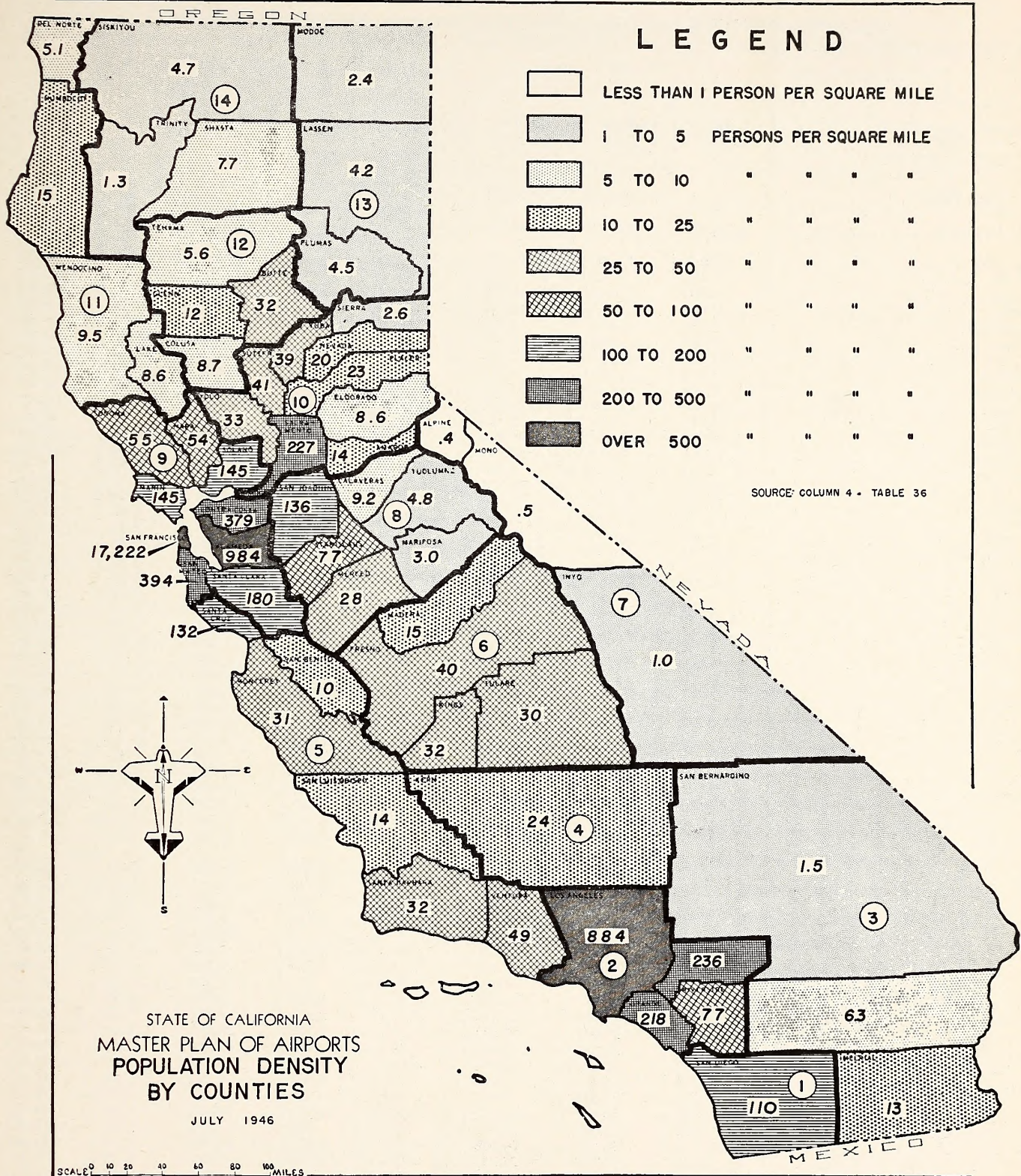
Area County	Estimated Population July 1, 1946	Land Area, Square Miles 1940 Census	Persons per Square Mile	Ratio to State Density
United States.....	141,000,000	2,977,128	47.4	0.80
California.....	9,335,000	156,803	59.5	1.00
Area 1. San Diego.....	470,500	4,258	110.5	1.86
Area 2. Los Angeles Metropolitan.....	4,089,535	7,153	573.2	9.63
Los Angeles.....	3,597,500	4,071	883.7	14.85
Orange.....	170,700	782	218.2	3.67
West Riverside.....	108,375	1,400	77.4	1.30
S.W. San Bernardino	212,960	900	236.6	3.97
Area 3. Desert.....	121,865	29,294	4.2	0.07
Imperial.....	56,700	4,284	13.2	0.22
Riverside.....	36,125	5,779	6.3	0.11
San Bernardino.....	29,040	19,231	1.5	0.03
Area 4. Kern.....	192,000	8,170	23.5	0.39
Area 5.....	400,650	13,087	30.6	0.51
Monterey.....	103,000	3,324	31.0	0.52
San Benito.....	14,450	1,396	10.4	0.17
San Luis Obispo.....	47,000	3,326	14.1	0.24
Santa Barbara.....	87,700	2,745	31.9	0.54
Santa Cruz.....	58,000	439	132.1	2.22
Ventura.....	90,500	1,857	48.7	0.82
Area 6.....	459,400	14,373	32.0	0.53
Fresno.....	237,500	5,985	39.7	0.67
Kings.....	44,400	1,395	31.8	0.53
Madera.....	32,500	2,148	15.1	0.25
Tulare.....	145,000	4,845	29.9	0.50
Area 7.....	11,485	13,859	.8	0.013
Alpine.....	285	723	.4	0.067
Inyo.....	9,800	10,091	1.0	0.167
Mono.....	1,400	3,045	.5	0.084

TABLE 36—Continued

POPULATION DENSITY—CALIFORNIA AVIATION
AREAS AND COUNTIES
July 1, 1946

Area County	Estimated Population July 1, 1946	Land Area, Square Miles 1940 Census	Persons per Square Mile	Ratio to State Density
Area 8.....	388,900	9,657	40.3	0.68
Calaveras.....	9,450	1,028	9.2	0.15
Mariposa.....	4,300	1,455	3.0	0.05
Merced.....	55,550	1,983	28.0	0.47
San Joaquin.....	192,000	1,410	136.2	2.29
Stanislaus.....	116,650	1,506	77.5	1.30
Tuolumne.....	10,950	2,275	4.8	0.08
Area 9. San Francisco Metropolitan.....	2,515,150	6,988	359.9	6.05
Alameda.....	721,500	733	984.3	16.54
Contra Costa.....	278,500	734	379.4	6.38
Marin.....	75,600	521	145.1	2.44
Napa.....	42,700	790	54.1	.91
San Francisco.....	775,000	45	17,222.2	289.44
San Mateo.....	179,000	454	394.2	6.63
Santa Clara.....	236,000	1,305	180.8	3.04
Solano.....	119,750	827	144.8	2.43
Sonoma.....	87,100	1,579	55.2	0.93
Area 10.....	386,140	8,951	43.1	0.72
Amador.....	8,200	594	13.8	0.23
El Dorado.....	14,850	1,725	8.6	0.14
Nevada.....	19,400	979	20.0	0.34
Placer.....	33,250	1,431	23.2	0.39
Sacramento.....	224,000	985	227.4	3.82
Sierra.....	2,490	958	2.6	0.04
Sutter.....	24,900	607	41.0	0.69
Yolo.....	34,300	1,034	33.2	0.56
Yuba.....	24,750	638	38.7	0.65
Area 11.....	101,250	9,342	10.8	0.18
Del Norte.....	5,100	1,003	5.1	0.086
Humboldt.....	51,950	3,573	14.5	0.24
Lake.....	10,750	1,256	8.6	0.14
Mendocino.....	33,450	3,510	9.5	0.15
Area 12.....	95,050	7,109	13.4	0.23
Butte.....	53,100	1,665	31.9	0.54
Colusa.....	10,000	1,153	8.7	0.15
Glenn.....	15,350	1,317	11.7	0.20
Tehama.....	16,600	2,974	5.6	0.094
Area 13.....	40,150	11,212	3.6	0.060
Lassen.....	19,000	4,548	4.2	0.071
Modoc.....	9,650	4,094	2.4	0.040
Plumas.....	11,500	2,570	4.5	0.076
Area 14.....	62,925	13,350	4.7	0.079
Shasta.....	29,450	3,846	7.7	0.129
Siskiyou.....	29,400	6,313	4.7	0.079
Trinity.....	4,075	3,191	1.3	0.022

Source: For United States—Bureau of Census-Report Series, P46-No. 7.
For California—Midpoint of California Taxpayers Association estimates of January 1, 1946, and January 1, 1947.



CALIFORNIA AIRPORTS

TABLE 37
CALIFORNIA COUNTY RURAL-FARM, RURAL NONFARM, AND URBAN DWELLINGS, 1940

	All Dwellings				Rural-Farm Dwellings			
	All Units	Occupied Units	Population	Population per Unit	Occupied Units	Population	Population per Unit	Percent of Total
United States.....		34,854,532	131,669,275		7,106,559			23.2
California.....	2,340,373	2,138,343	6,907,387	3.23	175,841	635,389	3.61	9.2
Alameda.....	173,031	165,201	513,011	3.11	2,956	11,207	3.79	2.3
Alpine.....	159	100	323	3.23	20	67		20.7
Amador.....	2,968	2,661	8,973	3.37	388	1,258	3.24	14.0
Butte.....	14,488	13,414	42,840	3.37	3,153	10,465	3.32	24.5
Calaveras.....	3,159	2,797	8,221	2.94	579	1,723	2.98	21.0
Colusa.....	3,125	2,911	9,788	3.36	1,054	3,781	3.59	38.6
Contra Costa.....	31,297	29,830	100,450	3.37	2,945	10,384	3.53	10.4
Del Norte.....	1,836	1,567	4,745	3.03	305	1,022	3.35	21.5
El Dorado.....	6,726	4,420	13,229	2.99	1,153	3,302	2.86	25.9
Fresno.....	54,505	50,012	178,565	3.57	15,013	56,741	3.78	31.9
Glenn.....	3,745	3,527	12,195	3.46	1,625	5,978	3.68	49.0
Humboldt.....	15,386	14,321	45,812	3.20	2,410	8,424	3.50	18.5
Imperial.....	16,400	15,263	59,740	3.91	4,535	19,015	4.19	31.9
Inyo.....	2,770	2,372	7,625	3.21	149	588	3.95	7.7
Kern.....	39,801	37,961	135,124	3.56	5,835	21,725	3.72	16.2
Kings.....	11,110	9,615	35,168	3.66	3,529	13,723	3.89	39.1
Lake.....	4,126	2,728	8,069	2.96	980	2,997	3.06	37.1
Lassen.....	4,567	4,286	14,479	3.38	658	2,115	3.21	14.6
Los Angeles.....	961,531	893,602	2,785,643	3.12	9,758	35,998	3.69	1.9
Madera.....	6,945	6,211	23,314	3.75	3,256	12,443	3.82	53.4
Marin.....	16,472	13,576	52,907	3.90	854	2,962	3.47	6.0
Mariposa.....	2,229	1,983	5,605	2.83	456	1,459	3.20	26.0
Mendocino.....	8,625	7,800	27,864	3.57	2,656	8,670	3.26	31.2
Merced.....	14,464	12,927	46,988	3.63	5,689	21,519	3.78	46.0
Modoc.....	2,979	2,695	8,713	3.23	842	3,048	3.62	35.0
Mono.....	1,078	776	2,299	2.96	121	431	3.56	18.7
Monterey.....	23,154	20,057	73,032	3.64	3,529	14,348	4.07	19.7
Napa.....	8,752	7,679	28,503	3.71	2,314	6,958	3.01	24.5
Nevada.....	6,846	6,021	19,283	3.20	657	2,205	3.36	11.5
Orange.....	49,019	41,027	130,760	3.19	4,717	16,634	3.53	14.0
Placer.....	10,332	8,414	28,108	3.34	1,979	6,919	3.50	25.3
Plumas.....	4,159	3,489	11,548	3.31	219	700	3.20	6.1
Riverside.....	36,663	31,011	105,524	3.40	5,256	17,783	3.38	20.9
Sacramento.....	51,715	49,134	170,333	3.47	5,132	20,052	3.91	11.9
San Benito.....	3,403	3,256	11,392	3.50	1,457	5,322	3.65	46.8
San Bernardino.....	63,175	47,666	161,108	3.38	5,153	16,340	3.17	12.3
San Diego.....	100,245	90,179	289,348	3.21	6,025	19,168	3.18	7.4
San Francisco.....	222,176	206,011	634,536	3.08				
San Joaquin.....	38,210	36,569	134,207	3.67	8,656	35,328	4.08	26.5
San Luis Obispo.....	11,891	10,231	33,246	3.25	2,522	9,315	3.69	28.4
San Mateo.....	37,230	33,516	111,782	3.34	964	3,438	3.57	3.3
Santa Barbara.....	22,664	21,239	70,555	3.32	2,244	8,436	3.76	12.6
Santa Clara.....	56,406	51,916	174,949	3.37	7,230	25,335	3.50	14.9
Santa Cruz.....	22,048	14,968	45,057	3.01	2,198	7,498	3.41	17.4
Shasta.....	9,762	8,985	28,800	3.21	1,545	5,140	3.33	17.9
Sierra.....	1,395	1,082	3,025	2.80	101	306	3.03	10.1
Siskiyou.....	9,493	8,737	28,598	3.27	1,552	5,463	3.52	19.1
Solano.....	15,312	14,559	49,118	3.37	2,488	8,790	3.53	17.9
Sonoma.....	26,831	21,641	69,052	3.19	8,116	25,583	3.15	12.8
Stanislaus.....	22,848	21,883	74,866	3.42	7,683	27,816	3.62	37.2
Sutter.....	5,686	5,539	18,680	3.37	2,391	8,134	3.40	43.8
Tehama.....	4,781	4,476	14,316	3.20	2,043	6,825	3.35	47.8
Trinity.....	1,513	1,438	3,970	2.76	393	1,175	2.99	29.6
Tulare.....	31,993	29,638	107,152	3.62	11,161	42,360	3.80	39.7
Tuolumne.....	4,961	3,598	10,887	3.03	560	1,675	2.99	15.4
Ventura.....	20,772	19,015	69,685	3.66	3,610	13,460	3.73	19.9
Yolo.....	8,148	7,776	27,243	3.50	2,259	9,082	4.02	33.4
Yuba.....	5,268	5,001	17,034	3.41	768	2,746	3.58	16.1

Source: United States Census, 1940.

TABLE 37—Continued

CALIFORNIA COUNTY RURAL-FARM, RURAL NONFARM, AND URBAN DWELLINGS, 1940

	Rural Non-Farm Dwellings				Urban Dwellings			
	Occupied Units	Population	Population per Unit	Percent of Total	Occupied Units	Population	Population per Unit	Percent of Total
United States.....	7,151,473			20.5	20,596,500			56.3
California.....	393,950	1,369,733	3.48	19.8	1,568,552	4,902,265	3.13	71.0
Alameda.....	8,600	29,736	3.46	5.8	153,645	472,068	3.07	91.9
Alpine.....	80	256	3.20	79.3				
Amador.....	2,273	7,715	3.39	86.0				
Butte.....	5,791	18,667	3.22	43.6	4,470	13,708	3.07	31.9
Calaveras.....	2,218	6,498	2.93	79.0				
Colusa.....	1,857	6,007	3.23	61.4				
Contra Costa.....	11,262	38,280	3.40	38.1	15,623	51,784	3.31	51.5
Del Norte.....	1,262	3,723	2.95	78.5				
El Dorado.....	2,270	6,863	3.02	51.9	997	3,064	3.07	22.2
Fresno.....	12,893	45,259	3.51	25.3	22,106	76,565	3.46	42.8
Glenn.....	1,902	6,217	3.27	51.0				
Humboldt.....	6,334	20,333	3.21	44.4	5,577	17,055	3.06	37.1
Imperial.....	3,783	13,575	3.59	22.7	6,945	27,150	3.91	45.4
Inyo.....	2,223	7,037	3.17	92.5				
Kern.....	21,440	76,369	3.56	56.5	10,686	37,070	3.46	27.3
Kings.....	3,747	13,211	3.53	37.6	2,339	8,234	3.52	25.3
Lake.....	1,748	5,072	2.90	62.9				
Lassen.....	3,628	12,364	3.41	85.4				
Los Angeles.....	110,248	376,097	3.41	13.5	773,596	2,373,548	3.07	84.6
Madera.....	1,198	4,414	3.68	18.9	1,757	6,457	3.68	27.7
Marin.....	5,263	27,195	5.17	51.4	7,459	22,750	3.05	42.6
Mariposa.....	1,527	4,146	2.72	74.0				
Mendocino.....	2,962	12,228	4.13	43.9	2,182	6,966	3.20	24.9
Merced.....	4,462	15,334	3.44	32.6	2,776	10,135	3.65	21.4
Modoc.....	1,853	5,665	3.06	65.0				
Mono.....	655	1,868	2.85	81.3				
Monterey.....	7,316	27,928	3.82	38.2	9,212	30,756	3.34	42.1
Napa.....	2,808	13,805	4.92	48.4	2,557	7,740	3.03	27.1
Nevada.....	3,597	11,377	3.16	59.0	1,767	5,701	3.23	29.5
Orange.....	10,849	37,628	3.47	28.8	25,461	76,498	3.00	57.2
Placer.....	3,264	10,523	3.22	37.4	3,171	10,666	3.37	37.3
Plumas.....	3,270	10,848	3.32	93.9				
Riverside.....	9,835	34,378	3.50	32.6	15,920	53,363	3.35	46.5
Sacramento.....	10,920	41,270	3.78	24.2	33,082	109,011	3.29	63.9
San Benito.....	593	2,189	3.69	19.2	1,206	3,881	3.22	34.0
San Bernardino.....	13,636	48,771	3.58	30.3	28,877	95,997	3.32	57.4
San Diego.....	9,237	31,289	3.39	10.8	74,917	238,891	3.20	82.0
San Francisco.....					206,011	634,536	3.08	100.0
San Joaquin.....	8,501	29,080	3.41	21.6	19,412	69,799	3.60	51.9
San Luis Obispo.....	3,923	12,005	3.06	36.1	3,786	11,926	3.15	35.5
San Mateo.....	8,078	28,250	3.50	25.3	24,474	80,094	3.27	71.4
Santa Barbara.....	4,214	15,260	3.62	21.6	14,781	46,859	3.17	65.8
Santa Clara.....	10,803	42,202	3.91	24.1	33,883	107,412	3.17	61.0
Santa Cruz.....	3,987	11,726	2.94	26.0	8,783	25,833	2.94	56.6
Shasta.....	4,954	15,551	3.14	54.0	2,486	8,109	3.26	28.1
Sierra.....	981	2,719	2.77	89.9				
Siskiyou.....	7,185	23,135	3.22	80.9				
Solano.....	6,057	20,256	3.34	41.2	6,014	20,072	3.34	40.9
Sonoma.....	5,660	20,323	3.59	29.4	7,865	23,146	2.95	57.8
Stanislaus.....	6,761	23,240	3.44	31.0	7,439	23,810	3.20	31.8
Sutter.....	1,554	5,578	3.59	29.9	1,594	4,968	3.12	26.3
Tehama.....	1,218	3,657	3.00	25.5	1,215	3,824	3.15	26.7
Trinity.....	1,045	2,795	2.67	70.4				
Tulare.....	7,784	29,289	3.76	27.3	10,693	35,503	3.32	33.0
Tuolumne.....	3,038	9,212	3.03	84.6				
Ventura.....	5,568	22,204	3.99	31.9	9,873	34,021	3.45	48.2
Yolo.....	3,514	11,524	3.28	42.3	2,003	6,637	3.31	24.3
Yuba.....	2,321	7,642	3.29	44.9	1,912	6,646	3.48	39.0

Nearly three-quarters of the residents of California are city people. Within the more populous areas mentioned above are 60 cities with 10,000 or more inhabitants. Los Angeles (1,805,700) is the largest city west of Chicago and San Francisco (827,400) is the commercial hub of northern California. Other major cities are Oakland (400,900), San Diego (362,700), Long Beach (241,100), Sacramento (120,000), Berkeley (100,000), Glendale (96,500) Pasadena (98,300), San Jose (80,700), Fresno (63,700) and Santa Monica (67,500).

Tourists

There is a close relationship between population growth and recreation. A large proportion of California's new citizens came first as tourists bent on pleasure and recreation. They liked what they visited and remained to become permanent residents of the State. This experience is being repeated in the case of thousands of new defense workers brought to California, and military personnel passing through or stationed in California, as a result of World War II.

Large urban populations in any state create a demand for recreational facilities, and as has been shown in this report, the greater percentage of the State's population is urban. The many and varied scenic beauty spots of the State and the number of non-urban public recreation areas play an important part in the absorption of the larger increments of leisure enjoyed by city dwellers. Californians are an outdoors, travel-minded people. Their desire to escape the city and move about the State in large numbers complicates the problem of providing access to recreational areas beyond city boundaries. However, this subject presents a truly great challenge when out-of-state visitors join the vacationing State residents.

Every year from 2,000,000 to 4,000,000 tourists come into California by automobile, train, bus, plane and boat. Every year they spend about \$400,000,000.

During 1946, 2,944,000 visitors came to southern California alone; 62 percent of these visitors stopped in hotel and resort accommodations, 32 percent with friends or relatives and 6 percent in trailers or tents, and they spent \$509,000,000, an amount greater than that spent in the entire State in previous years. (Source: All Year Club). These funds, representing a net income greater than that provided by the motion picture or citrus industries, are brought into California for the purpose of buying scenery, health-giving sunlight, rest, refreshment and the many forms of pleasure and recreation offered by this State. The culture, improvement and sale of these intangible goods means as much to California as the sale of manufactured articles or agricultural products.

California has long been attractive to residents of Northern and Central states who wish to get away from winter snow and cold. For them the sunny desert resorts, the drier inland cities and the equable temperatures and natural beauties of shoreline areas have special appeal.

The summer attractions of California have also become more widely popular. People throughout the country come to enjoy the pleasant rainless days and cool nights characteristic of the coastal area between San Diego and San Francisco. They know about the beaches, Yosemite, the giant redwoods, the mountains and other vacation spots best visited during the summer. More tourists now come to California during the summer than in winter.

All parts of the State draw visitors, but the greatest centers of activity are in and around Los Angeles, San Diego and Santa Barbara. This coastal area has the beaches, palm trees, orange groves and motion picture studios, which to many Easterners epitomize California. However, tourists make the rounds of scenic areas from border to border, and heavily patronize all types of outdoor recreation. The State is obligated to provide certain types of play and recreation facilities and access thereto far in excess of those needed by local residents.

6. INDICES OF PURCHASING POWER

The Purpose and Method of Selecting Indices of Purchasing Power

Among the economic factors affecting a master plan of airports for California the actual individual wealth of the inhabitants of each Area is of especial importance. The volume of airplane passengers is closely correlated to the ability of the people within the Area to pay for this form of transportation. The potential of private aircraft owners depends largely on the amount of money which individuals have at hand to buy a commodity which will be considered, especially at the start, a luxury. It is requisite to have a knowledge of both

passenger and private airplane potentials to determine accurately the airport facilities needed by the different Aviation Areas of the State.

There are various well-known indices of purchasing power published by leading economists and financial periodicals. These indices are devised with a specific purpose in mind—to determine a potential market for a single commodity, for a certain class of commodities, or for selected commodities consumed by an average family. To accomplish the purpose proposed the economists make a careful selection of factors which, in simple or weighted aggregation, reflect the particular market potential desired. As a result, these indices differ widely in the economic factors used.

Many different types of economic data might have been chosen to satisfy the two requirements of this survey—the presentation of sound evidence of individual wealth in the Aviation Areas and the ultimate development of these factors into a private airplane buying potential index. It is believed that the data presented best satisfy this two-fold requirement from a statistical point of view.

Individual Indices of Purchasing Power

The importance of the amount of per capita individual incomes in ascertaining the wealth of a region is obvious. Table 38 lists 1940 and 1945 totals of per capita individual incomes for California by Aviation Areas and Counties with a comparison of California and United States averages. It might be mentioned

TABLE 38

TOTAL AND PER CAPITA INDIVIDUAL INCOMES FOR CALIFORNIA BY AVIATION AREAS AND COUNTIES—1940 AND 1945

Area County	1940				1945				Percent Change 1940 to 1945
	Total of Individual Incomes (Thou- sand \$)	Per Capita Income	Percent of Cali- fornia Per Capita	Percent of U. S. Per Capita Income	Total of Individual Incomes (Thou- sand \$)	Per Capita Income	Per- cent of Cali- fornia per Capita	Percent of U. S. Per Capita Income	
United States.....	\$75,852,000	\$576	-----	100.00	\$152,704,000	\$1,094	-----	100.00	89.93
California.....	5,549,300	803	100.00	139.41	12,481,400	1,374	100.00	125.59	71.11
Area 1. San Diego.....	198,936	688	85.68	119.44	543,605	1,146	83.41	104.75	66.57
Area 2. Los Angeles Metropolitan.....	2,581,897	830	103.38	144.10	5,519,830	1,380	100.44	126.14	66.27
Los Angeles.....	2,390,816	858	106.85	148.96	5,047,118	1,428	103.93	130.53	66.43
Orange.....	74,206	567	70.61	98.44	174,640	1,043	75.91	95.34	83.95
West Riverside*.....	39,107	494	61.52	85.76	95,466	948	69.00	86.65	91.90
S.W. San Bernardino*.....	77,768	549	68.37	95.31	202,606	1,029	74.89	94.06	87.43
Area 3. Desert.....	56,139	532	66.26	92.36	136,968	1,181	85.95	107.95	121.99
Imperial.....	32,499	544	67.75	94.44	77,518	1,394	101.46	127.42	156.25
Riverside*.....	13,035	494	61.52	85.76	31,822	948	69.00	86.65	91.90
San Bernardino*.....	10,605	549	68.37	95.31	27,628	1,029	74.89	94.06	87.43
Area 4. Kern.....	89,729	664	82.69	115.28	217,145	1,213	88.28	110.88	82.68
Area 5.....	226,527	748	93.17	129.86	519,774	1,374	100.00	125.59	83.69
Monterey.....	56,337	771	96.01	133.85	122,947	1,265	92.07	115.63	64.07
San Benito.....	7,724	678	84.43	117.71	18,396	1,421	103.42	129.89	109.58
San Luis Obispo.....	21,305	641	79.83	111.28	46,841	1,056	76.86	96.53	64.74
Santa Barbara.....	65,594	930	115.82	161.46	116,980	1,388	101.02	126.87	49.25
Santa Cruz.....	26,302	584	72.73	101.39	52,218	1,014	73.80	92.69	73.63
Ventura.....	49,265	707	88.04	122.74	162,392	1,842	134.06	168.37	160.54
Area 6.....	198,205	576	71.74	100.00	479,531	1,159	84.35	105.94	101.22
Fresno.....	106,290	595	74.10	103.30	246,378	1,141	83.04	104.30	91.76
Kings.....	21,629	615	76.59	106.77	48,523	1,189	86.54	108.68	93.33
Madera.....	12,152	521	64.88	90.45	28,334	959	69.80	87.66	84.07
Tulare.....	58,134	543	67.62	94.27	156,296	1,227	89.30	112.16	125.97
Area 7.....	7,570	739	92.04	128.30	11,709	1,064	77.44	97.26	43.98
Alpine.....	284	879	109.46	152.60	391	1,564	113.83	142.96	77.93
Inyo.....	5,748	754	93.90	130.90	9,260	975	70.96	89.12	29.31
Mono.....	1,538	669	83.31	116.15	2,058	1,646	119.80	150.46	146.04

CALIFORNIA AIRPORTS

TABLE 38—Continued

TOTAL AND PER CAPITA INDIVIDUAL INCOMES FOR CALIFORNIA BY AVIATION AREAS AND COUNTIES—1940 AND 1945

Area County	1940				1945				Percent Change 1940 to 1945
	Total of Individual Incomes (Thou- sand \$)	Per Capita Income	Percent of Cali- fornia Per Capita	Percent of U. S. Per Capita Income	Total of Individual Incomes (Thou- sand \$)	Per Capita Income	Per- cent of Cali- fornia per Capita	Percent of U. S. Per Capita Income	
Area 8.....	174,450	621	77.35	107.81	438,507	1,196	87.05	109.32	92.59
Calaveras.....	5,138	626	77.83	108.51	7,210	853	62.08	77.97	36.48
Mariposa.....	3,538	631	78.58	109.55	4,725	1,167	84.93	106.67	84.94
Merced.....	26,916	573	71.36	99.48	64,879	1,239	90.17	113.25	116.23
San Joaquin.....	88,074	656	81.69	113.89	242,396	1,314	95.63	120.11	100.30
Stanislaus.....	43,762	585	72.85	101.56	109,675	1,025	74.60	93.69	75.21
Tuolumne.....	7,022	645	80.32	111.98	9,622	948	69.00	86.65	46.98
Area 9. San Francisco Metropolitan.....	1,629,190	939	116.96	163.02	3,858,107	1,542	112.23	140.95	64.22
Alameda.....	419,905	819	101.99	142.19	1,073,910	1,453	105.75	132.82	77.41
Contra Costa.....	65,473	652	81.20	113.19	295,986	1,119	81.44	102.29	71.63
Marin.....	28,595	540	67.25	93.75	85,040	1,102	80.20	100.73	104.07
Napa.....	17,118	601	74.84	104.34	46,353	1,086	79.04	99.27	80.70
San Francisco.....	812,754	1,281	159.53	222.40	1,649,549	2,128	154.88	194.52	66.12
San Mateo.....	88,169	789	98.26	136.98	196,941	1,106	80.49	101.10	40.18
Santa Clara.....	115,188	658	81.94	114.24	252,523	1,127	82.02	103.02	71.28
Solano.....	46,775	952	118.56	165.28	174,495	1,466	106.70	134.00	53.99
Sonoma.....	35,213	510	63.51	88.54	83,310	1,003	73.00	91.68	96.67
Area 10.....	221,622	724	90.18	125.69	444,554	1,229	89.45	112.34	69.75
Amador.....	5,679	633	78.83	109.90	7,220	969	70.52	88.57	53.08
El Dorado.....	8,892	672	83.69	116.67	14,443	1,066	77.58	97.44	58.63
Nevada.....	11,252	584	72.73	101.39	10,521	613	44.61	56.03	4.97
Placer.....	16,482	586	72.98	101.74	32,784	1,063	77.37	97.17	81.40
Sacramento.....	133,323	783	97.51	135.94	279,668	1,316	95.78	120.29	68.07
Sierra.....	2,257	746	92.90	129.51	2,754	1,160	84.43	106.03	55.50
Sutter.....	13,372	716	89.17	124.31	31,684	1,405	102.26	128.43	96.23
Yolo.....	19,909	731	91.03	126.91	44,984	1,363	99.20	124.59	86.46
Yuba.....	10,456	614	76.46	106.60	20,496	923	67.18	84.37	50.33
Area 11.....	53,681	621	77.35	107.81	101,023	1,049	76.35	95.89	68.92
Del Norte.....	2,294	483	60.15	83.85	3,255	845	61.50	77.24	74.95
Humboldt.....	32,230	704	87.67	122.22	61,734	1,183	86.10	108.14	68.04
Lake.....	4,269	529	65.88	91.84	8,652	911	66.30	83.27	72.21
Mendocino.....	14,888	534	66.50	92.71	27,382	890	64.77	81.35	66.67
Area 12.....	46,067	582	72.49	101.04	93,289	1,045	76.06	95.52	79.55
Butte.....	23,966	559	69.61	97.05	45,853	916	66.67	83.73	63.86
Colusa.....	6,976	713	88.79	123.78	15,344	1,582	115.14	144.61	121.88
Glenn.....	7,525	617	76.84	107.12	16,500	1,162	84.57	106.22	88.33
Tehama.....	7,600	531	66.13	92.19	15,592	1,016	73.94	92.87	91.34
Area 13.....	27,046	779	97.03	135.24	51,741	1,325	96.43	121.12	70.09
Lassen.....	11,699	808	100.62	140.28	24,765	1,321	96.14	120.75	63.49
Modoc.....	6,793	780	97.14	135.42	14,658	1,527	111.14	139.58	95.77
Plumas.....	8,554	741	92.28	128.65	12,318	1,151	83.77	105.21	55.33
Area 14.....	38,241	623	77.60	108.16	65,617	1,151	83.77	105.21	84.75
Shasta.....	14,228	494	61.52	85.76	27,030	1,054	76.71	96.34	113.36
Siskiyou.....	21,635	757	94.27	131.42	36,427	1,289	93.81	117.82	70.28
Trinity.....	2,378	599	74.60	103.99	2,160	691	50.29	63.16	15.36

* Estimated apportionment of county totals of Riverside and San Bernardino between Areas 2 and 3.

Source: Total individual income figures from California State Chamber of Commerce.
United States totals from United States Department of Commerce, *Survey of Current Business*, August, 1946.

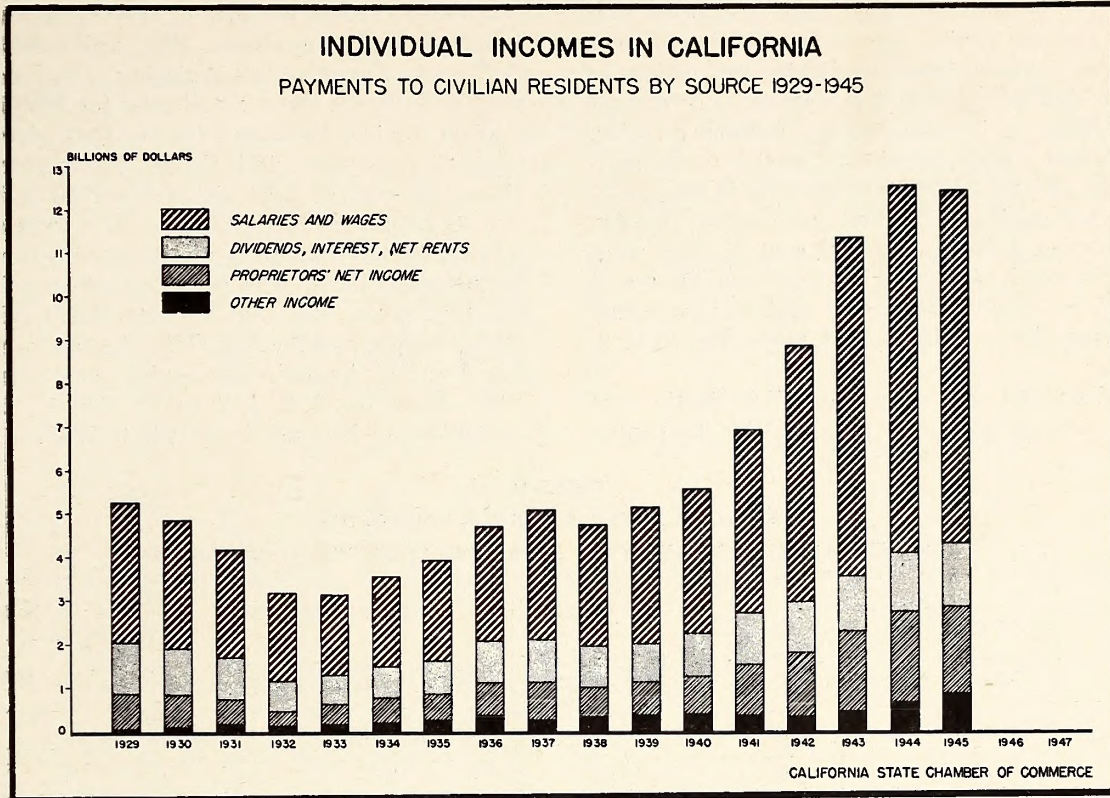


FIGURE 3

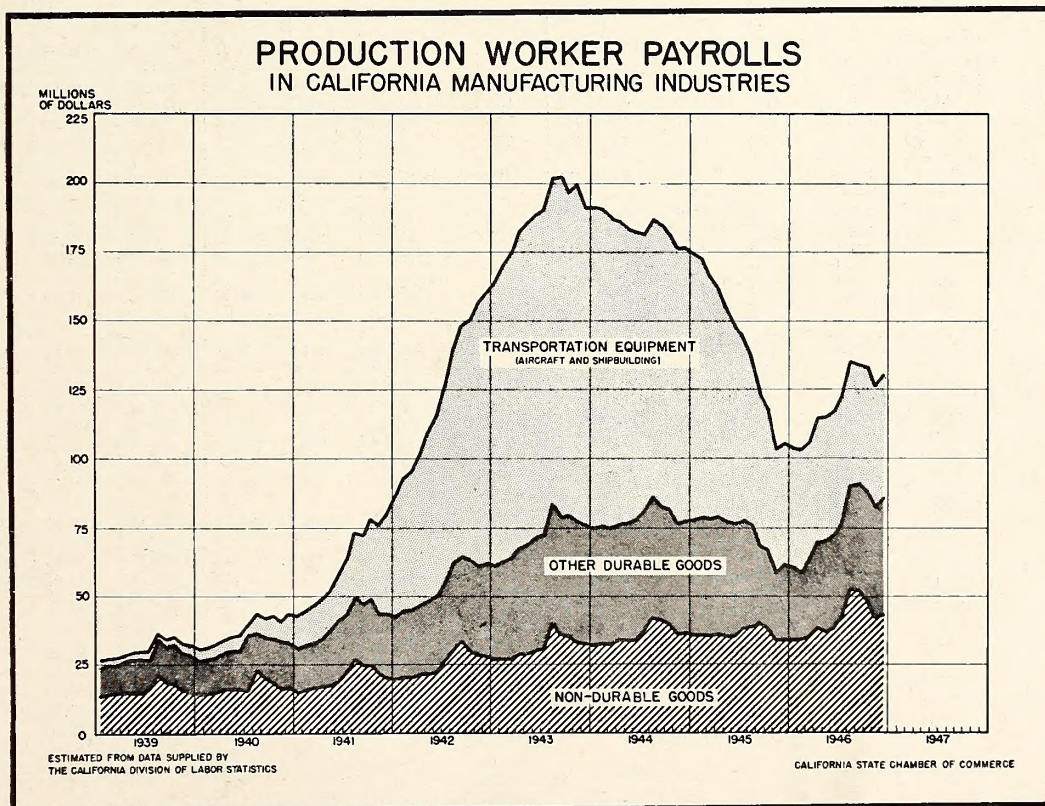


FIGURE 4

here that the population totals used throughout in computing the per capita figures were United States Census Bureau totals, when available, and estimates of the California Taxpayers' Association for intracensal years. Here, as in many of the following tables, there is so great a concentration of wealth in the metropolitan centers that the State average is unusually high. The per capita individual incomes of the five leading Aviation Areas in order of rank in 1945 were the Bay Area, the Los Angeles Metropolitan Area, and Areas No. 5, 13, and 10. The Areas highest in percentage of increase from 1940 to 1945 were Nos. 3, 6, 8, 14, and 5.

Per capita retail sales are a valuable indication not only of the amount of wealth possessed by the people

of a given district but also of the willingness of these people to make purchases. Per capita retail sales of California Counties and Aviation Areas are enumerated in Table 39. Gross retail sales for 1939, the closest censal total to 1940, and for 1945 are given for purposes of comparison with United States averages. Taxable sales only are also listed for 1940 and 1945. As will be explained later, taxable sales were selected as a better factor than gross retail sales for the final buying potential index. The San Diego Metropolitan Area, the Bay Area, the Los Angeles Metropolitan Area, Kern County, and the Mid-Coastal Area were the ranking Aviation Areas in per capita gross retail sales in 1945. Areas No. 1, 9, 4, 2, and 8 showed the greatest percentage of increase from 1939 to 1945.

TABLE 39
PER CAPITA RETAIL SALES FOR CALIFORNIA
GROSS AND TAXABLE—BY AVIATION AREAS AND COUNTIES—1939-1940-1945

	Gross Retail Sales—1939				Taxable Sales—1940		Gross Retail Sales—1945				Per- cent Change 1939- 1945	Taxable Sales—1945	
	Thousands, Dollars	Per Capita	Percent of California	Percent of U. S.	Dollars	Per Capita	Thousands, Dollars	Per Capita	Percent of California	Percent of U. S.		Dollars	Per Capita
United States.....	\$42,041,790	\$319	-----	100.00	-----	-----	\$74,625,000	\$534	-----	100.00	67.40	-----	-----
California.....	\$3,187,809	461	100.00	144.51	\$3,345,292,267	\$484	\$6,709,271	739	100.00	138.39	60.30	\$6,511,293,960	\$717
Area 1. San Diego.....	120,707	417	90.46	130.72	117,214,967	405	338,378	1,169	158.19	218.91	180.34	331,907,040	699
Area 2. Los Angeles Metropolitan.....	1,446,404	461	100.00	144.51	1,589,935,296	507	3,065,078	977	132.21	182.96	111.93	3,009,756,106	753
Los Angeles.....	1,314,497	472	102.39	147.96	1,475,154,933	530	2,774,893	996	134.78	186.52	111.01	2,742,212,440	776
Orange.....	50,112	383	83.08	120.06	45,925,500	351	108,552	830	112.31	155.43	116.71	101,455,840	606
W. Riverside*.....	29,218	369	80.04	115.67	24,046,700	304	63,545	803	108.66	150.37	117.62	57,828,360	574
S.W. S. Bernardino*.....	52,577	371	80.48	116.30	44,808,163	316	118,088	833	112.72	155.99	124.52	108,259,466	550
Area 3. Desert.....	40,631	385	83.51	120.69	39,233,171	372	72,715	690	93.37	129.21	79.22	68,268,534	588
Imperial.....	23,721	397	86.12	124.45	25,107,400	420	35,430	593	80.24	111.05	49.37	34,229,760	616
Riverside*.....	9,740	369	80.04	115.67	8,015,567	304	21,182	803	108.66	150.37	117.62	19,276,120	574
San Bernardino*.....	7,170	371	80.48	116.30	6,110,204	316	16,103	833	112.72	155.99	124.53	14,762,654	550
Area 4. Kern.....	58,972	436	94.58	136.68	55,207,500	409	125,887	932	126.12	174.53	113.76	119,957,720	670
Area 5.....	137,469	454	98.48	142.32	118,145,401	390	255,722	844	114.21	158.05	85.90	239,347,040	633
Monterey.....	34,616	474	102.82	148.59	28,724,767	393	66,012	904	122.33	169.29	90.72	61,890,240	637
San Benito.....	3,921	344	74.62	107.84	3,581,067	314	6,830	600	81.19	112.36	74.42	6,174,600	477
San Luis Obispo.....	14,812	446	96.75	139.81	12,218,067	368	31,589	950	128.55	177.90	113.00	30,079,760	678
Santa Barbara.....	36,344	515	111.71	161.44	32,404,700	459	63,594	901	121.92	168.73	74.95	59,519,920	706
Santa Cruz.....	21,663	481	104.34	150.78	20,743,467	460	34,423	764	103.38	143.07	58.84	33,266,640	646
Ventura.....	26,113	375	81.34	117.55	20,473,333	294	53,274	764	103.38	143.07	103.73	48,415,880	549
Area 6.....	134,072	390	84.60	122.26	125,824,433	366	255,613	743	100.54	139.14	90.51	238,252,040	576
Fresno.....	78,420	661	143.38	207.21	77,124,767	650	153,148	858	116.10	160.67	29.80	147,812,760	684
Kings.....	13,645	388	84.16	121.63	12,590,933	358	23,423	666	90.12	124.72	71.65	21,076,360	517
Madera.....	6,984	300	65.08	94.04	5,259,033	226	13,792	592	80.11	110.86	97.33	11,151,000	377
Tulare.....	35,023	327	70.93	102.51	30,849,700	288	65,250	609	82.41	114.04	86.24	58,211,920	457
Area 7.....	4,937	482	104.56	151.10	4,282,667	418	7,749	756	102.30	141.57	56.85	6,617,120	602
Alpine†.....	31	96	20.82	30.09	89,300	276	65	201	27.20	37.64	109.38	36,960	148
Inyo.....	4,092	537	116.49	168.34	3,558,067	467	6,761	887	120.03	166.10	65.18	5,701,200	600
Mono.....	814	354	76.79	110.97	635,300	276	923	401	54.26	77.09	13.28	878,960	703

TABLE 39—Continued
PER CAPITA RETAIL SALES FOR CALIFORNIA
GROSS AND TAXABLE—BY AVIATION AREAS AND COUNTIES—1939-1940-1945

	Gross Retail Sales—1939				Taxable Sales—1940		Gross Retail Sales—1945				Per- cent Change 1939- 1945	Taxable Sales—1945	
	Thousands, Dollars	Per Capita	Percent of California	Percent of U. S.	Dollars	Per Capita	Thousands, Dollars	Per Capita	Percent of California	Percent of U. S.		Dollars	Per Capita
Area 8.....	117,229	418	76.79	131.03	106,424,134	379	232,419	828	112.04	155.06	98.09	222,851,640	608
Calaveras.....	2,799	340	73.75	106.58	2,214,467	269	3,220	392	53.04	73.41	15.29	2,358,080	279
Mariposa.....	1,662	297	64.43	93.10	2,605,600	465	2,231	398	53.86	74.53	34.01	2,108,400	521
Merced.....	17,877	380	82.43	119.12	14,308,633	305	31,857	678	91.75	126.97	78.42	29,187,480	558
San Joaquin.....	55,130	411	89.15	128.84	55,135,067	411	124,040	924	125.03	173.03	124.82	120,562,520	653
Stanislaus.....	34,641	463	100.43	145.14	27,956,400	373	64,438	861	116.51	161.24	85.96	62,697,040	586
Tuolumne.....	5,120	470	101.95	147.34	4,203,967	386	6,633	609	82.41	114.04	29.57	5,938,120	585
Area 9. San Francisco Metropolitan.....	876,396	505	109.54	158.31	967,191,599	558	1,951,558	1,125	152.23	210.67	122.77	1,905,575,040	761
Alameda.....	250,580	488	105.86	152.98	249,595,967	487	551,589	1,075	145.47	201.31	120.29	522,798,200	707
Contra Costa.....	34,397	342	74.19	107.21	31,029,033	309	131,511	1,309	177.13	245.13	282.75	100,392,400	380
Marin.....	18,448	349	75.70	109.40	12,859,633	243	38,058	719	97.29	134.64	106.02	29,247,800	379
Napa.....	11,426	401	86.98	125.71	9,108,933	320	23,767	834	112.86	156.18	107.98	21,111,480	494
San Francisco.....	383,554	604	131.02	189.34	514,916,733	811	846,081	1,333	180.38	249.63	120.70	915,248,480	1,181
San Mateo.....	43,452	389	84.38	121.94	34,166,900	306	91,644	820	110.96	153.56	110.80	69,885,960	393
Santa Clara.....	79,769	456	98.92	142.95	74,394,900	425	147,453	843	114.07	157.87	84.87	138,380,600	595
Solano.....	19,005	387	83.95	121.32	15,107,133	308	66,482	1,354	183.22	253.56	249.87	57,698,320	485
Sonoma.....	35,765	518	112.36	162.38	26,012,367	377	54,973	796	107.71	149.06	53.67	50,811,800	611
Area 10.....	146,077	478	103.69	149.84	130,276,100	426	245,188	802	108.53	150.19	67.78	229,282,480	634
Amador.....	3,418	381	82.65	119.44	3,285,800	366	3,684	411	55.62	76.97	7.87	3,033,280	407
El Dorado.....	4,563	345	74.84	108.15	4,487,000	339	6,763	511	69.15	95.69	48.12	5,421,800	400
Nevada.....	8,819	457	99.13	143.26	7,113,667	369	9,530	494	66.85	92.51	8.10	7,857,040	458
Placer.....	11,243	400	86.77	125.39	9,478,300	337	17,486	622	84.17	116.48	55.50	15,104,240	490
Sacramento.....	91,716	538	116.70	168.65	83,891,533	493	161,193	946	128.01	177.15	75.84	156,562,080	737
Sierra.....	901	298	64.64	93.42	955,600	316	857	283	38.29	53.00	-5.03	705,080	297
Sutter.....	3,792	203	44.03	63.64	2,810,233	150	7,605	407	55.07	76.22	100.49	5,767,680	256
Yolo.....	10,007	367	79.61	115.05	8,778,400	322	17,058	626	84.71	117.23	70.57	14,538,000	441
Yuba.....	11,618	682	147.94	213.79	9,475,567	556	21,012	1,234	166.98	231.09	80.94	20,293,280	914
Area 11.....	33,447	387	83.95	121.32	29,283,966	339	53,561	619	83.76	115.92	59.95	46,876,440	487
Del Norte.....	1,890	398	86.33	124.76	1,873,833	395	2,960	624	84.44	116.85	56.78	2,757,160	716
Humboldt.....	19,619	428	92.84	134.17	17,879,433	390	30,301	661	89.45	123.78	54.44	27,089,760	519
Lake.....	2,832	351	76.14	110.03	2,614,700	324	5,772	715	96.75	133.90	103.70	5,039,600	530
Mendocino.....	9,106	327	70.93	102.51	6,916,000	248	14,528	521	70.50	97.57	59.33	11,989,920	390
Area 12.....	33,566	424	91.97	132.92	29,013,166	367	51,893	656	88.77	122.85	54.72	45,379,400	508
Butte.....	18,588	434	94.14	136.05	14,620,600	341	30,121	703	95.13	131.65	61.98	26,381,960	527
Colusa.....	4,114	420	91.11	131.66	4,459,833	456	5,919	605	81.87	113.30	44.05	5,463,080	563
Glenn.....	4,964	407	88.29	127.59	3,666,200	301	7,476	613	82.95	114.79	50.61	6,404,320	451
Tehama.....	5,900	412	89.37	129.15	6,266,533	438	8,377	585	79.16	109.55	41.99	7,130,040	464
Area 13.....	12,069	347	75.27	108.78	11,511,267	331	19,218	553	74.83	103.56	59.37	16,452,440	421
Lassen.....	5,631	389	84.38	121.94	5,606,200	387	8,678	599	81.06	112.17	53.98	7,104,760	379
Modoc.....	2,467	283	61.39	88.71	2,491,800	286	4,404	505	68.34	94.57	78.45	3,739,720	390
Plumas.....	3,971	344	74.62	107.84	3,413,267	296	6,136	531	71.85	99.44	54.36	5,607,960	524
Area 14.....	25,833	421	91.32	131.97	21,748,600	354	34,292	559	75.64	104.68	32.78	30,770,920	540
Shasta.....	13,587	472	102.39	147.96	8,985,100	312	16,876	586	79.30	109.74	24.15	15,695,560	612
Siskiyou.....	11,411	399	86.55	125.08	11,649,333	407	16,413	574	77.67	107.49	43.86	14,352,840	508
Trinity.....	835	210	45.55	65.83	1,114,167	281	1,003	253	34.24	47.38	20.48	722,520	231

* Estimated apportionment of county totals of Riverside and San Bernardino between Areas 2 and 3.

† Estimated apportionment of county totals between Alpine and Amador Counties.

Source: a California State Chamber of Commerce Research Department, Economic Survey Series 1944-1945, Report No. 8.

b California State Board of Equalization, Division of Research and Statistics.

c United States totals from Statistical Abstract of the United States.

Because of the importance of agriculture among the basic industries of the State it was considered necessary to include per capita gross cash farm income among the indications of personal wealth. Table 40 catalogues the per capita gross cash farm income of the Aviation Areas and Counties for 1940 and 1945.

In the later year Areas 6, 12, 8, 3, and 5 led in per capita cash farm income and Areas 6, 3, 14, 8, and 13 in the amount of increase between 1940 and 1945.

Assessed valuation was chosen as one of the few indications of residual wealth available in county totals. Table 41 gives the per capita assessed valuation of

TABLE 40
GROSS CASH FARM INCOME FOR CALIFORNIA BY AVIATION AREAS AND COUNTIES—1940 AND 1945

Area County	1940				1945				Percent Change 1940 to 1945
	Income		Percent of California Average	Percent of U.S. Average	Income		Percent of California Average	Percent of U.S. Average	
	Total Thousands of Dollars	Per Capita 1940			Total Thousands of Dollars	Per Capita 1945			
United States.....	\$8,343,000	\$63	-----	100.00	\$20,780,900	\$149	-----	100.00	136.50
California.....	672,926	97	100.00	153.97	1,786,497	294	100.00	197.32	203.09
Area 1. San Diego.....	17,000	59	60.82	93.65	41,298	87	29.59	58.39	47.46
Area 2. Los Angeles Metro- politan.....	123,870	39	40.21	61.90	328,445	82	27.89	55.03	110.26
Los Angeles.....	67,000	24	24.74	38.10	175,820	50	17.01	33.56	108.33
Orange.....	21,500	164	169.07	260.32	63,385	378	128.57	253.69	130.49
West Riverside*.....	14,250	180	185.57	285.71	35,267	350	119.05	234.90	94.44
Southwest San Bernardino*..	21,120	149	153.61	236.50	53,973	274	93.20	183.89	83.89
Area 3. Desert.....	28,630	272	280.41	431.75	75,746	653	222.11	438.26	140.07
Imperial.....	21,000	352	362.89	558.73	56,631	1,019	346.60	683.89	189.48
Riverside*.....	4,750	180	185.57	285.71	11,755	350	119.05	234.90	94.44
San Bernardino*.....	2,880	149	153.61	236.51	7,360	274	93.20	183.89	83.89
Area 4. Kern.....	27,000	200	206.19	317.46	73,608	411	139.80	275.84	105.50
Area 5.....	80,900	267	275.26	423.81	199,642	528	179.59	354.36	97.75
Monterey.....	22,200	304	313.40	482.54	53,462	550	187.07	369.13	80.92
San Benito.....	5,800	509	524.74	807.94	14,516	1,121	381.29	752.35	120.23
San Luis Obispo.....	9,700	292	301.03	463.49	26,578	599	203.74	402.01	105.14
Santa Barbara.....	14,400	204	210.31	323.81	35,778	425	144.56	285.23	108.33
Santa Cruz.....	6,300	140	144.32	222.22	16,970	330	112.24	221.48	135.71
Ventura.....	22,500	323	332.99	512.70	52,338	594	202.04	398.66	83.90
Area 6.....	103,000	299	308.25	474.60	313,820	758	257.82	508.72	153.51
Fresno.....	39,200	220	226.80	349.21	123,687	573	194.90	384.56	160.45
Kings.....	12,500	355	365.98	563.49	32,711	802	272.80	338.26	125.92
Madera.....	9,400	403	415.46	639.68	23,512	796	270.75	534.23	97.52
Tulare.....	41,900	391	403.09	620.63	133,910	1,051	357.48	705.37	168.79
Area 7.....	2,003	195	201.03	309.52	3,943	358	121.77	240.27	83.59
Alpine.....	133	412	424.74	653.97	251	1,004	341.50	673.83	143.68
Inyo.....	1,300	170	175.26	269.84	2,648	279	94.90	187.25	64.12
Mono.....	570	248	255.67	393.65	1,044	835	284.01	560.40	236.69
Area 8.....	87,730	312	321.65	495.24	251,324	686	233.33	460.40	119.87
Calaveras.....	1,000	122	125.77	193.65	2,291	271	92.18	181.88	122.13
Mariposa.....	780	139	143.30	220.63	1,637	404	137.41	271.14	190.65
Merced.....	20,300	432	445.36	685.71	54,995	1,051	357.48	705.37	143.28
San Joaquin.....	39,000	291	300.00	461.90	117,554	637	216.67	427.52	118.90
Stanislaus.....	25,700	343	353.61	544.44	72,986	682	231.97	457.72	98.83
Tuolumne.....	950	87	89.69	138.10	1,861	183	62.24	122.82	110.34
Area 9. San Francisco Metro- politan.....	94,600	55	56.70	87.30	246,051	98	33.33	65.77	78.18
Alameda.....	11,600	23	23.71	36.51	28,622	39	13.27	26.17	69.57
Contra Costa.....	8,000	80	82.47	126.98	20,956	79	26.87	53.02	-1.25
Marin.....	5,100	96	98.97	152.38	11,040	143	48.64	95.97	48.95
Napa.....	5,000	175	180.41	277.78	14,414	338	114.97	226.85	93.14
San Francisco.....	1,000	2	2.06	3.17	2,045	3	1.02	2.01	50.00
San Mateo.....	6,100	55	56.70	87.30	15,130	85	28.91	57.05	54.55
Santa Clara.....	21,500	123	126.80	195.24	59,595	266	90.48	178.52	116.26
Solano.....	12,300	250	257.73	396.83	28,827	242	82.31	162.42	-3.20
Sonoma.....	24,000	348	358.76	552.38	65,422	787	267.69	528.19	126.15

TABLE 40—Continued

GROSS CASH FARM INCOME FOR CALIFORNIA BY AVIATION AREAS AND COUNTIES—1940 AND 1945

Area County	1940				1945				Percent Change 1940 to 1945
	Income		Percent of California Average	Percent of U.S. Average	Income		Percent of California Average	Percent of U.S. Average	
	Total Thousands of Dollars	Per Capita 1940			Total Thousands of Dollars	Per Capita 1945			
Area 10.....	53,883	176	181.44	279.37	126,495	350	119.05	234.90	98.86
Amador.....	1,150	23	23.71	36.51	2,188	39	13.27	26.17	69.57
El Dorado.....	1,800	136	140.21	215.87	4,724	349	118.71	234.23	156.62
Nevada.....	700	36	37.11	57.14	1,412	82	27.89	55.03	127.78
Placer.....	4,600	164	169.07	260.32	12,983	421	143.20	282.55	156.71
Sacramento.....	15,700	92	94.85	146.03	35,471	167	56.80	112.08	81.52
Sierra.....	333	110	113.40	174.60	665	280	95.24	187.92	154.55
Sutter.....	12,700	680	701.03	1,079.37	28,827	1,278	434.69	857.72	87.94
Yolo.....	14,000	514	529.90	815.87	32,507	985	335.03	661.07	91.63
Yuba.....	2,900	170	175.26	269.84	7,718	348	118.37	233.56	104.71
Area 11.....	13,635	158	162.89	250.79	31,398	326	110.88	218.79	106.33
Del Norte.....	535	113	116.49	179.37	1,036	269	91.50	180.54	138.05
Humboldt.....	6,100	133	137.11	211.11	13,494	259	88.10	173.83	94.74
Lake.....	2,000	248	255.67	393.65	5,316	560	190.48	375.84	125.81
Mendocino.....	5,000	179	184.54	284.13	11,552	376	127.89	252.35	110.06
Area 12.....	25,900	327	337.11	519.05	61,437	688	234.01	461.74	110.40
Butte.....	8,300	194	200.00	307.94	21,263	425	144.56	285.23	119.07
Colusa.....	5,500	562	579.38	892.06	13,187	1,359	462.24	912.08	141.81
Glenn.....	6,800	558	575.26	885.71	15,027	1,058	359.86	710.07	89.60
Tehama.....	5,300	370	381.44	587.30	11,960	779	264.97	522.82	110.54
Area 13.....	6,940	200	206.19	317.46	16,542	424	144.22	284.56	112.00
Lassen.....	2,300	159	163.92	252.38	5,317	284	96.60	190.60	78.62
Modoc.....	3,700	425	438.14	674.60	9,405	980	333.33	657.72	130.59
Plumas.....	940	81	83.51	128.57	1,820	170	57.82	114.09	109.87
Area 14.....	7,835	128	131.96	203.17	16,748	294	100.00	197.32	129.69
Shasta.....	2,300	80	82.47	126.98	5,000	195	66.33	130.87	143.75
Siskiyou.....	5,200	182	187.63	288.89	11,042	391	132.99	262.42	114.84
Trinity.....	335	84	86.60	133.33	706	226	76.87	151.68	169.04

* Estimated apportionment of county totals of Riverside and San Bernardino between Areas 2 and 3.

Source: California Crops and Livestock Reporting Service.
United States totals from *Statistical Abstract of the United States*, 1946.

Aviation Areas and Counties for 1940 and 1945. Per capita total assessed valuation was listed for purposes of comparison between the Areas. In 1945 Areas 4, 7, 6, 5, and 14 outranked the other Aviation Areas in this factor, while Areas 4, 1, 6, 2, and 3 had the greatest percentage of increase. The per capita assessed valuation less public utilities was also tabulated in columns No. 4 and 10 for developing the final buying potential index. The application of this factor will be discussed later.

Other indices of purchasing power were computed to broaden the basis of economic comparison between

the different Aviation Areas in the concluding Area treatments. Table 42 lists automobile and truck registrations by California Aviation Areas for 1930, 1935, 1940, and 1945. In 1945 Areas 12 and 14 led the State in per capita registration while Areas 5 and 2 tied for third place. Areas 4, 6, 7, 8, and 11 come next with the same per capita figure. Percentages of changes were included but are of little value for the period 1940 to 1945 because of the curtailment of automobile production for civilians during the war.

Per capita bank deposits of individuals, partnerships, and corporations by Aviation Areas for 1941,

CALIFORNIA AIRPORTS

TABLE 41

ASSESSED VALUATION AND PER CAPITA VALUE FOR CALIFORNIA AVIATION AREAS AND COUNTIES—1940-1945

Area County	1940 Assessed Valuation					1945 Assessed Valuation					
	Total All Properties	Per Capita Value	Per cent of Calif- ornia Per Capita	Valuation Less Public Utilities	Per Capita Value	Total All Properties	Per Capita Value	Per- cent of Calif- ornia Per Capita	Per- cent Change 1940 to 1945	Valuation Less Public Utilities	Per Capita Value
	1	2	3	4	5	6	7	8	9	10	11
California.....	\$7,138,621,257	\$1,033	100.00	\$6,176,041,457	\$894	\$8,541,172,363	\$1,404	100.00	35.91	\$7,451,031,453	\$820
Area 1. San Diego	221,461,643	765	74.06	194,048,523	671	327,971,815	1,321	94.09	72.68	292,915,895	617
Area 2. Los Angeles—Metro- politan.....	2,871,398,649	915	88.58	2,560,981,613	816	3,459,534,926	1,261	89.81	37.81	3,103,183,042	776
Los Angeles.....	2,485,965,560	892	86.35	2,234,665,970	802	2,978,392,865	1,230	87.61	37.89	2,697,296,595	763
Orange.....	192,370,150	1,471	142.40	177,217,530	1,355	235,179,840	1,979	140.95	34.53	218,299,870	1,303
West Riverside*	65,843,003	832	80.54	57,571,462	727	85,591,403	1,246	88.75	49.76	74,500,575	740
S.W. San Bernardino*	127,219,936	897	86.83	91,526,651	646	160,370,818	1,203	85.68	34.11	113,086,002	574
Area 3. Desert.....	73,847,156	700	67.76	62,500,702	593	90,569,877	937	66.74	33.86	76,075,781	655
Imperial.....	36,175,677	606	58.66	30,829,307	516	42,218,298	736	52.42	21.45	35,821,438	644
Riverside*	21,947,667	832	80.54	19,190,488	727	28,530,467	1,246	88.75	49.76	24,833,525	740
San Bernardino*	15,723,812	813	78.70	12,480,907	646	19,821,112	1,203	85.68	47.97	15,420,818	574
Area 4. Kern.....	284,195,485	2,103	203.58	248,914,505	1,842	350,601,630	3,877	276.14	84.36	310,899,770	1,737
Area 5.....	397,203,911	1,311	126.91	356,507,751	1,177	478,993,913	1,729	123.15	31.88	429,472,223	1,135
Monterey.....	94,070,191	1,288	124.69	84,627,681	1,159	108,606,440	1,679	119.59	30.36	97,046,140	998
San Benito.....	14,968,675	1,314	127.30	13,056,085	1,146	16,548,770	1,620	115.38	23.29	14,577,020	1,126
San Luis Obispo.....	40,645,542	1,223	118.39	34,416,952	1,035	44,835,587	1,485	105.77	21.42	37,236,767	840
Santa Barbara.....	111,562,129	1,581	153.05	102,001,089	1,446	132,732,622	1,879	133.83	18.85	121,170,022	1,438
Santa Cruz.....	37,632,595	835	80.83	33,667,445	747	40,668,894	982	69.94	17.60	36,362,534	706
Ventura.....	98,324,779	1,411	136.59	88,738,499	1,273	135,601,600	2,262	161.11	60.31	123,079,740	1,396
Area 6.....	496,917,893	1,444	139.79	390,505,933	1,135	585,385,949	2,193	156.20	51.87	472,919,349	1,143
Fresno.....	270,462,680	1,515	146.66	197,576,260	1,106	351,340,500	2,417	172.15	59.54	275,251,170	1,274
Kings.....	107,982,330	3,070	297.19	100,995,250	2,872	85,352,740	3,283	233.83	6.94	77,728,390	1,905
Madera.....	28,606,239	1,227	118.78	22,155,539	950	35,264,774	2,180	155.27	77.67	28,001,994	948
Tulare.....	89,866,644	839	81.22	69,778,884	651	113,427,935	1,428	101.71	70.20	91,937,795	722
Area 7.....	21,792,002	2,127	205.91	16,139,102	1,575	25,125,162	2,284	162.96	7.38	18,711,562	1,701
Alpine.....	1,412,626	4,373	423.33	499,476	1,546	1,455,072	5,820	414.53	33.09	536,332	2,145
Inyo.....	14,453,101	1,895	183.45	11,671,451	1,531	17,504,262	1,843	131.27	—2.75	13,833,532	1,456
Mono.....	5,926,275	2,578	249.56	3,968,175	1,726	6,165,828	4,933	351.35	91.35	4,341,698	3,473
Area 8.....	274,522,085	978	94.68	231,389,155	824	351,642,025	959	68.30	—1.94	303,533,915	828
Calaveras.....	11,184,200	1,360	131.66	7,925,920	964	12,346,530	1,461	104.06	7.43	8,835,570	1,046
Mariposa.....	5,018,766	895	86.64	4,420,826	789	6,066,115	1,498	106.70	67.37	5,477,545	1,352
Merced.....	51,511,045	1,096	106.10	43,138,475	918	60,656,480	1,159	82.55	5.75	51,236,150	979
San Joaquin.....	125,576,240	936	90.61	107,776,320	803	167,749,285	909	64.74	—2.89	147,033,825	797
Stanislaus.....	65,793,160	879	85.09	58,719,730	784	89,702,290	838	59.69	—4.67	81,896,920	765
Tuolumne.....	15,438,674	1,418	137.27	9,407,884	864	15,121,325	1,490	106.13	5.08	9,053,905	892

CALIFORNIA AIRPORTS

91

TABLE 41—Continued

ASSESSED VALUATION AND PER CAPITA VALUE FOR CALIFORNIA AVIATION AREAS AND COUNTIES—1940-1945

Area County	1940 Assessed Valuation					1945 Assessed Valuation					
	Total All Properties	Per Capita Value	Per cent of Cali- fornia Per Capita	Valuation Less Public Utilities	Per Capita Value	Total All Properties	Per Capita Value	Per- cent of Cali- fornia Per Capita	Per- cent Change 1940 to 1945	Valuation Less Public Utilities	Per Capita Value
	1	2	3	4	5	6	7	8	9	10	11
Area 9. San Fran- cisco Metro- politan.....	1,869,447,899	1,078	104.36	1,642,923,939	947	2,150,583,876	859	61.18	-20.32	1,909,520,896	763
Alameda.....	455,205,215	887	85.87	388,894,465	758	525,853,755	712	50.71	-19.73	455,463,215	616
Contra Costa.....	132,283,380	1,317	127.49	114,035,380	1,091	197,996,665	749	53.35	-43.13	169,850,275	642
Marin.....	49,065,847	927	89.74	43,486,077	822	55,829,637	724	51.57	-21.90	49,970,397	648
Napa.....	24,026,422	843	81.61	21,670,682	760	31,692,685	742	52.85	-11.98	29,042,805	680
San Francisco.....	820,546,398	1,293	125.17	731,108,428	1,152	846,625,476	1,092	77.78	-15.55	763,021,396	985
San Mateo.....	119,834,211	1,072	103.78	107,135,701	958	143,870,838	808	57.55	-24.63	129,444,458	727
Santa Clara.....	159,127,190	910	88.09	142,049,850	812	205,055,945	915	65.17	.55	185,962,125	830
Solano.....	42,888,643	873	84.51	34,195,763	696	66,564,320	559	39.81	-35.97	56,189,770	472
Sonoma.....	66,470,593	963	93.22	60,347,593	874	77,094,555	928	66.10	-3.64	70,576,455	849
Area 10.....	320,040,872	1,046	101.26	245,550,262	803	372,724,101	1,031	73.43	-1.44	287,987,951	796
Amador.....	16,385,070	1,826	176.77	6,673,430	744	16,866,555	2,264	161.25	23.99	7,131,995	957
El Dorado.....	15,592,405	1,179	114.13	11,312,015	855	16,039,881	1,184	84.33	.42	11,685,121	862
Nevada.....	17,683,425	917	88.77	9,750,935	506	18,968,990	1,106	78.77	20.61	10,270,820	599
Placer.....	35,817,807	1,274	123.33	19,165,127	682	40,842,750	1,324	94.30	3.92	21,202,340	687
Sacramento.....	150,916,620	886	85.77	128,084,690	752	186,052,614	876	62.39	-1.13	158,538,574	746
Sierra.....	2,652,037	877	84.90	2,317,607	766	3,228,130	1,359	96.79	54.96	2,794,700	1,177
Sutter.....	24,262,365	1,299	125.75	21,064,435	1,128	28,774,918	1,276	90.88	-1.77	25,084,688	1,112
Yolo.....	36,860,293	1,353	130.98	31,984,773	1,174	40,882,408	1,239	88.25	-8.43	35,556,588	1,077
Yuba.....	19,870,850	1,167	112.97	15,197,250	892	21,067,855	949	67.59	-18.68	15,723,125	708
Area 11.....	85,627,549	990	95.84	77,690,379	898	89,389,547	928	66.10	-6.26	80,492,927	836
Del Norte.....	5,147,242	1,085	105.03	4,942,812	1,042	5,187,945	1,348	96.01	24.24	4,997,215	1,298
Humboldt.....	46,969,513	1,025	99.23	43,563,213	995	47,325,185	907	64.60	-11.51	43,424,365	832
Lake.....	8,618,745	1,068	103.39	6,548,315	812	10,803,738	1,137	80.98	6.46	8,794,898	926
Mendocino.....	24,892,049	893	86.45	22,636,039	812	26,072,679	848	60.40	-5.04	23,276,449	757
Area 12.....	104,634,287	1,322	127.98	82,552,917	1,043	120,353,297	1,348	96.01	1.97	94,857,507	1,062
Butte.....	44,719,897	1,044	101.06	32,288,807	754	50,694,075	1,013	72.15	-2.97	36,061,945	721
Colusa.....	19,954,930	2,039	197.39	17,534,090	1,791	24,465,870	2,522	179.63	23.69	21,739,170	2,241
Glenn.....	20,242,950	1,660	160.70	17,623,900	1,445	23,218,480	1,635	116.45	-1.51	20,290,210	1,429
Tehama.....	19,716,510	1,377	133.30	15,106,120	1,055	21,974,872	1,432	101.99	3.99	16,766,182	1,092
Area 13.....	50,533,955	1,455	140.84	27,672,385	797	55,977,622	1,433	102.07	-1.51	29,864,892	765
Lassen.....	15,236,865	1,052	101.84	12,103,025	836	17,277,637	921	65.60	-12.45	12,686,207	677
Modoc.....	11,573,920	1,328	128.56	8,207,600	942	13,967,790	1,456	103.63	9.56	9,436,350	983
Plumas.....	23,723,170	2,054	198.84	7,361,760	637	24,732,195	2,311	164.60	12.51	7,742,335	724
Area 14.....	66,997,871	1,092	105.71	38,664,291	630	82,318,623	1,444	102.85	32.23	40,595,743	712
Shasta.....	37,087,741	1,288	124.69	18,069,731	627	47,961,808	1,870	133.19	45.19	17,589,498	686
Siskiyou.....	26,375,650	922	89.25	17,540,650	613	30,768,190	1,089	77.56	18.11	20,048,610	710
Trinity.....	3,534,480	890	86.16	3,053,910	769	3,588,625	1,148	81.77	28.99	2,957,635	946

* Estimated apportionment of county totals of Riverside and San Bernardino between Areas 2 and 3.

Source: Statements of Assessed Valuations, Office of the State Controller.

CALIFORNIA AIRPORTS

TABLE 42

AUTOMOBILE AND TRUCK REGISTRATIONS FOR CALIFORNIA BY AVIATION AREAS

Area Number and Name	1930				1935				Percent Change 1930 to 1935
	Registrations		Per Capita		Registrations		Per Capita		
	Number	Per Capita	Percent of California	Percent of U. S.	Number	Per Capita	Percent of California	Percent of U. S.	
United States.....	26,545,000	.22	-----	100.00	26,231,000	.21	-----	100.00	—4.54
California.....	2,041,356	.36	100.00	163.64	2,150,740	.35	100.00	166.67	—2.78
1. San Diego Metropolitan	77,471	.37	102.78	168.18	85,253	.34	97.14	161.90	—8.11
2. Los Angeles Metropolitan*	956,920	.38	105.56	172.73	1,003,761	.37	105.71	176.19	—2.63
3. Desert*	37,678	.39	108.33	177.27	34,047	.35	100.00	166.67	—10.36
4. Kern County.....	36,082	.44	122.22	200.00	38,689	.43	122.86	204.76	—2.27
5. Mid Coastal.....	101,325	.40	111.11	181.82	106,183	.38	108.57	180.95	—5.00
6. Fresno Metropolitan.....	103,662	.39	108.33	177.27	106,143	.40	114.29	190.48	2.56
7. Inyo-Mono.....	3,370	.41	113.89	186.36	3,459	.37	105.71	176.19	—9.76
8. Stockton Metropolitan.....	85,289	.40	111.11	181.82	92,529	.40	114.29	190.48	.00
9. San Francisco Bay ---	469,810	.30	83.33	136.36	495,019	.30	85.71	142.86	.00
10. Sacramento Metropolitan.....	88,103	.36	100.00	163.64	99,457	.37	105.71	176.19	2.78
11. Redwood Empire.....	28,348	.36	100.00	163.64	28,796	.35	100.00	166.67	—2.78
12. Chico-Red Bluff.....	29,125	.42	116.67	190.91	30,868	.43	122.86	204.76	2.38
13. Modoc Plateau.....	9,534	.33	91.67	150.00	9,515	.35	100.00	166.67	6.06
14. Shasta Cascade.....	14,639	.35	97.22	159.09	17,021	.36	102.86	171.43	2.86

TABLE 42—Continued

AUTOMOBILE AND TRUCK REGISTRATIONS FOR CALIFORNIA BY AVIATION AREAS

Area Number and Name	1940				Percent Change 1935 to 1940	1945				Percent Change 1940 to 1945
	Registrations		Per Capita			Registrations		Per Capita		
	Number	Per Capita	Percent of Cali- fornia	Percent of United States		Number	Per Capita	Percent of Cali- fornia	Percent of United States	
United States -----	32,025,000	.24	-----	100.00	14.29	29,672,000†	.21	-----	100.00	—12.50
California -----	2,772,159	.40	100.00	166.67	14.29	2,853,177	.31	100.00	147.62	—22.50
1. San Diego Metropolitan -----	112,603	.39	98.00	162.50	14.71	137,705	.29	93.55	138.10	—25.64
2. Los Angeles Metropolitan* -----	1,307,375	.42	105.00	175.00	13.51	1,344,208	.34	109.68	161.90	—19.05
3. Desert* -----	42,295	.40	100.00	166.67	14.29	37,677	.32	103.23	152.38	—20.00
4. Kern County -----	56,903	.42	105.00	175.00	—2.33	58,299	.33	106.45	157.14	—21.43
5. Mid Coastal -----	130,068	.43	108.00	179.17	13.16	128,184	.34	109.68	161.90	—20.93
6. Fresno Metropolitan -----	139,750	.41	103.00	170.83	2.50	137,489	.33	106.45	157.14	—19.51
7. Inyo-Mono -----	4,444	.43	108.00	179.17	16.22	3,659	.33	106.45	157.14	—23.26
8. Stockton Metropolitan -----	115,750	.41	103.00	170.83	2.50	120,545	.33	106.45	157.14	—19.51
9. San Francisco Bay -----	627,780	.36	90.00	150.00	20.00	672,948	.27	87.10	128.57	—25.00
10. Sacramento Metropolitan -----	125,413	.41	103.00	170.83	10.81	116,323	.32	103.23	152.38	—21.96
11. Redwood Empire -----	33,938	.39	98.00	162.50	11.43	31,676	.33	106.45	157.14	—15.38
12. Chico-Red Bluff -----	35,325	.45	113.00	187.50	4.65	32,685	.37	119.35	176.19	—17.78
13. Modoc Plateau -----	14,015	.40	100.00	166.67	14.29	11,433	.29	93.55	138.10	—27.50
14. Shasta Cascade -----	26,500	.43	108.00	179.17	19.44	20,346	.36	116.13	171.43	—16.28

* Estimated apportionment of Riverside and San Bernardino Counties between Areas 2 and 3.

† United States total for 1945, estimated.

Source: State of California, Division of Motor Vehicles.
United States totals from Statistical Abstract of the United States, 1946.

TABLE 43
BANK DEPOSITS OF INDIVIDUALS, PARTNERSHIPS AND CORPORATIONS
FOR CALIFORNIA BY AVIATION AREAS

Area Number and Name	1941				1942				Percent Change 1941 to 1942
	Deposits		Per Capita		Deposits		Per Capita		
	Thousand Dollars	Per Capita	Percent of California	Percent of U.S.	Thousand Dollars	Per Capita	Percent of California	Percent of U.S.	
United States-----	\$66,026,000	\$496	-----	100.00	\$74,673,000	\$558	-----	100.00	12.50
California-----	4,256,734	602	100.00	121.37	5,504,149	741	100.00	132.80	23.09
1. San Diego Metropolitan	115,738	358	59.47	72.18	220,950	602	81.24	107.89	68.16
2. Los Angeles Metro- politan*	1,644,466	516	85.71	104.03	2,145,905	642	86.64	115.05	24.42
3. Desert*	20,235	190	31.56	38.31	31,306	295	39.81	52.87	55.26
4. Kern County-----	33,387	240	39.87	48.39	46,073	329	44.40	58.96	37.08
5. Mid Coastal-----	140,892	450	74.75	90.73	185,430	576	77.73	103.23	28.00
6. Fresno Metropolitan---	104,365	295	49.00	59.48	146,689	406	54.79	72.76	37.63
7. Inyo-Mono-----	1,837	169	28.07	34.07	2,776	233	31.44	41.76	37.87
8. Stockton Metropolitan.	106,564	376	62.46	75.81	151,295	526	70.99	94.27	39.89
9. San Francisco Bay----	1,865,513	1,051	174.58	211.90	2,279,988	1,211	163.43	217.03	15.22
10. Sacramento Metro- politan-----	143,709	459	76.25	92.54	188,396	582	78.54	104.30	26.80
11. Redwood Empire-----	29,326	344	57.14	69.35	36,754	439	59.24	78.67	27.62
12. Chico-Red Bluff-----	26,829	335	55.65	67.54	36,601	456	61.54	81.72	36.12
13. Modoc Plateau-----	7,664	210	34.88	42.34	10,638	281	37.92	50.36	33.81
14. Shasta Cascade-----	16,209	249	41.36	50.20	21,348	313	42.24	56.09	25.70

TABLE 43—Continued
BANK DEPOSITS OF INDIVIDUALS, PARTNERSHIPS AND CORPORATIONS
FOR CALIFORNIA BY AVIATION AREAS

Area Number and Name	1943				Percent Change 1942 to 1943	1944				Percent Change 1943 to 1944
	Deposits		Per Capita			Deposits		Per Capita		
	Thousand Dollars	Per Capita	Percent of Cali- fornia	Percent of U.S.		Thousand Dollars	Per Capita	Percent of Cali- fornia	Percent of U.S.	
United States.....	\$90,110,000	\$673	-----	100.00	20.61	\$102,545,000	\$774	-----	100.00	15.01
California.....	7,188,623	922	100.00	137.00	12.44	8,675,448	1,036	100.00	133.85	12.36
1. San Diego Metropolitan.....	267,419	669	72.56	99.41	11.13	329,813	776	74.90	100.26	15.99
2. Los Angeles Metropolitan*.....	2,864,432	820	88.94	121.84	27.73	3,576,906	1,077	103.96	139.15	31.34
3. Desert*.....	45,703	425	46.10	63.15	44.07	58,491	1,077	103.96	139.15	153.41
4. Kern County.....	69,381	514	55.75	76.37	56.23	91,006	583	56.27	75.32	13.42
5. Mid Coastal.....	256,700	798	86.55	118.57	38.54	311,744	882	85.14	113.95	10.53
6. Fresno Metropolitan.....	234,237	677	73.43	100.59	66.75	298,044	794	76.64	102.58	17.28
7. Inyo-Mono.....	3,615	316	34.27	46.95	35.62	4,203	391	37.74	50.52	23.73
8. Stockton Metropolitan.....	224,713	767	83.19	113.97	45.82	290,826	892	86.10	115.25	16.30
9. San Francisco Bay.....	2,836,674	1,354	146.85	201.19	11.81	3,245,547	1,436	138.61	185.53	6.06
10. Sacramento Metropolitan.....	241,832	745	80.80	110.70	28.01	291,504	878	84.75	113.44	17.85
11. Redwood Empire.....	51,288	608	65.94	90.34	38.50	62,600	709	68.44	91.60	16.61
12. Chico-Red Bluff.....	50,976	659	71.48	97.92	44.52	65,429	822	79.34	106.20	24.73
13. Modoc Plateau.....	13,323	343	37.20	50.97	22.06	16,591	418	40.35	54.01	21.87
14. Shasta Cascade.....	28,330	438	47.51	65.08	39.94	32,744	554	53.47	71.58	26.48

* Estimated apportionment of county totals for Riverside and San Bernardino between Areas 2 and 3.

Source: Statistical Abstract of the United States, United States Treasury Department.

1942, 1943, and 1944 are shown in Table 43. Areas 3, 2, 14, 12, and 7 increased the most rapidly from 1943 to 1944. Bank deposits are an excellent index of residual wealth and the preceding data has been used in the Area treatments for comparisons. Unfortunately it was impossible to obtain similar data with county totals for 1940 and 1945, and this economic factor had to be omitted from the buying potential index.

Per capita gross postal receipts at first class post offices for the different Aviation Areas and Counties during 1945 are catalogued in Table 44. The five leading Areas in order of rank were Nos. 9, 1, 2, 5, and 10. To prevent a distorted picture when comparisons are made with the State average, it should be recalled here again that the large Metropolitan Areas made this State average very high.

TABLE 44
GROSS POSTAL RECEIPTS AT FIRST CLASS POST OFFICES AND PER CAPITA BY CALIFORNIA
AVIATION AREAS AND COUNTIES—CALENDAR YEAR 1945

Area County	Postal Receipts	Per Capita	Percent California Per Capita	Area County	Postal Receipts	Per Capita	Percent California Per Capita
California.....	\$120,436,296	\$13.26	100.00	Area 9. San Francisco Metropolitan.....	\$64,590,177	\$25.81	194.65
Area 1. San Diego.....	5,464,992	11.52	86.88	Alameda.....	7,930,510	10.73	80.92
Area 2. Los Angeles Metropolitan.....	38,579,719	9.65	72.78	Contra Costa.....	1,439,059	5.44	41.03
Los Angeles.....	35,981,146	10.18	76.77	Marin.....	467,957	6.07	45.78
Orange.....	997,553	5.96	44.95	Napa.....	155,817	3.65	27.53
West Riverside.....	575,591	5.71	43.06	San Francisco.....	50,577,226	65.26	491.78
Southwest San Bernardino.....	1,025,429	5.21	39.29	San Mateo.....	1,003,114	5.64	42.53
Area 3. Desert.....	579,843	5.00	37.71	Santa Clara.....	1,675,809	7.48	56.41
Imperial.....	276,891	4.98	37.56	Solano.....	900,229	7.56	57.01
Riverside.....	162,490	4.84	36.50	Sonoma.....	440,456	5.30	40.00
San Bernardino.....	140,462	5.23	39.44	Area 10.....	2,878,300	7.96	60.03
Area 4. Kern.....	935,804	5.23	39.44	Amador.....			
Area 5.....	3,302,002	8.73	65.84	El Dorado.....	41,209	3.04	22.93
Monterey.....	1,008,720	10.38	78.28	Nevada.....	59,963	3.50	26.40
San Benito.....	63,968	4.94	37.25	Placer.....	152,089	4.93	37.18
San Luis Obispo.....	397,566	8.96	67.57	Sacramento.....	2,160,079	10.17	76.70
Santa Barbara.....	675,687	8.02	60.48	Sierra.....			
Santa Cruz.....	364,031	7.07	53.32	Sutter.....	61,569	2.73	20.60
Ventura.....	792,030	8.99	67.80	Yolo.....	82,256	2.49	18.78
Area 6.....	1,945,404	4.70	35.44	Yuba.....	321,135	14.47	109.13
Fresno.....	1,239,245	5.74	43.29	Area 11.....	218,861	2.27	17.12
Kings.....	167,227	4.10	30.92	Del Norte.....			
Madera.....	79,858	2.70	20.36	Humboldt.....	170,975	3.28	24.74
Tulare.....	459,074	3.60	27.15	Lake.....			
Area 7.....				Mendocino.....	47,886	1.56	11.76
Alpine.....				Area 12.....	292,645	3.28	24.74
Inyo.....				Butte.....	242,050	4.79	36.12
Mono.....				Colusa.....			
Area 8.....	1,403,526	3.83	28.88	Glenn.....			
Calaveras.....				Tehama.....	50,595	3.30	24.89
Mariposa.....				Area 13.....	42,656	1.09	8.22
Merced.....	160,150	3.06	23.08	Lassen.....	42,656	2.27	17.12
San Joaquin.....	824,801	4.47	33.71	Modoc.....			
Stanislaus.....	418,575	3.91	29.49	Plumas.....			
Tuolumne.....				Area 14.....	202,367	3.55	26.77
				Shasta.....	100,544	3.92	29.56
				Siskiyou.....	101,823	3.60	27.15
				Trinity.....			

Source: Compiled from city totals of United States Post Office Department.

Development of the Buying Potential Index

Table 45 gives in detail the steps followed in computing the buying potential index for private planes. The five economic factors used—individual incomes, retail sales, gross farm income, assessed valuation, and effective buying income—were carefully selected as the best indices of sufficient individual wealth to purchase and the best evidence of an actual desire to expend part of the wealth in the purchase of private planes. All of these economic factors were converted into comparable per capita figures to facilitate aggregation on a common basis. Columns No. 1, 2, 3, and 4 of Table 45 represent the arithmetic mean of the 1940 and 1945 per capita

total of the respective economic factors. Data for 1940 was chosen to represent the last normal year; data for 1945 was taken as the latest available year. An average of the totals of these two years should reflect permanent advances made during the war and at the same time avoid wartime peaks subject to recession.

The average per capita individual incomes of Column 1 were developed from 1940 and 1945 data found in Table 38. Individual incomes used here include income from all sources—salaries, wages, rents, interest, and dividends.

The average retail sales of Column 2 were derived from California State Board of Equalization data listed in Table 39. These taxable retail sales exclude food

TABLE 45
DEVELOPMENT OF BUYING POTENTIAL OR ECONOMIC INDEX FOR AVIATION AREAS AND COUNTIES—1945

Area	County	Average 1940 and 1945 Per Capitas				Per Capita Effective Buying Income 1945*	Total of All Factors Columns 1 to 5	Economic Index— Percent of State Average
		Indi- vidual Incomes Table 38	Retail Sales Table 39	Gross Farm Income Table 40	Assessed Valua- tion Table 41			
	Column	1	2	3	4	5	6	7
California		\$1,089	\$601	\$147	\$857	\$1,364	\$4,058	100
Area 1. San Diego		917	552	73	644	1,623	3,809	94
Area 2. Los Angeles Metropolitan		1,102	630	61	796	1,407	3,996	98
Los Angeles		1,143	653	37	782	1,450	4,065	100
Orange		805	478	271	1,329	1,117	4,000	99
West Riverside		721	439	265	734	854	3,013	74
S.W. San Bernardino		789	433	212	610	1,159	3,203	79
Area 3. Desert		857	480	463	624	1,087	3,511	87
Imperial		969	518	685	580	1,218	3,970	98
Riverside		721	439	265	734	854	3,013	74
San Bernardino		789	433	212	610	1,159	3,203	79
Area 4. Kern		939	540	306	1,790	1,053	4,628	114
Area 5		1,061	512	398	1,156	1,148	4,275	105
Monterey		1,018	515	427	1,078	1,049	4,087	101
San Benito		1,050	396	315	1,136	991	3,888	96
San Luis Obispo		848	523	446	938	970	3,725	92
Santa Barbara		1,159	582	314	1,442	1,571	5,068	125
Santa Cruz		799	553	235	727	1,234	3,548	87
Ventura		1,274	422	458	1,334	911	4,399	108
Area 6		868	471	529	1,139	1,017	4,024	99
Fresno		868	667	396	1,190	1,157	4,278	105
Kings		902	438	579	2,388	894	5,201	128
Madera		740	302	599	949	885	3,475	86
Tulare		885	372	721	687	834	3,499	86
Area 7		902	510	277	1,638	643	3,970	98
Alpine		1,222	212	708	1,845	825	4,812	119
Inyo		864	534	225	1,493	608	3,724	92
Mono		1,158	490	542	2,600	1,260	6,050	149

TABLE 45—Continued

DEVELOPMENT OF BUYING POTENTIAL OR ECONOMIC INDEX FOR AVIATION AREAS AND COUNTIES—1945

Area	County	Average 1940 and 1945 Per Capitas				Per Capita Effective Buying Income 1945*	Total of All Factors Columns 1 to 5	Economic Index- Percent of State Average
		Indi- vidual Incomes Table 38	Retail Sales Table 39	Gross Farm Income Table 40	Assessed Valua- tion Table 41			
		1	2	3	4				5	6	7
Column		1	2	3	4	5	6	7
Area 8.....		909	494	499	826	1,206	3,934	97
Calaveras.....		739	274	196	1,005	1,149	3,363	83
Mariposa.....		899	493	272	1,071	1,464	4,199	103
Merced.....		906	432	741	949	994	4,022	99
San Joaquin.....		985	532	464	800	1,321	4,102	101
Stanislaus.....		805	480	513	774	1,082	3,654	90
Tuolumne.....		796	486	135	878	1,460	3,755	93
Area 9. San Francisco Metropolitan.....		1,241	660	77	855	1,424	4,257	105
Alameda.....		1,136	597	31	687	1,631	4,082	101
Contra Costa.....		886	344	79	867	596	2,772	68
Marin.....		821	311	120	735	816	2,803	69
Napa.....		844	407	256	720	776	3,003	74
San Francisco.....		1,704	996	2	1,068	1,715	5,485	135
San Mateo.....		948	350	70	842	922	3,132	77
Santa Clara.....		892	510	194	821	1,580	3,997	98
Solano.....		1,209	396	246	584	796	3,231	80
Sonoma.....		756	494	567	862	1,246	3,925	97
Area 10.....		927	530	263	800	1,403	3,923	97
Amador.....		801	386	203	851	1,422	3,663	90
El Dorado.....		1,533	370	242	858	1,172	4,175	103
Nevada.....		598	414	59	553	1,118	2,742	68
Placer.....		824	414	292	684	1,277	3,491	86
Sacramento.....		1,050	615	130	749	1,552	4,096	101
Sierra.....		953	306	195	972	1,443	3,869	95
Sutter.....		1,060	203	979	1,120	855	4,217	104
Yolo.....		1,047	382	249	1,126	1,096	3,900	96
Yuba.....		768	735	259	800	1,372	3,934	97
Area 11.....		835	413	242	867	1,072	3,429	85
Del Norte.....		664	556	191	1,170	1,383	3,964	98
Humboldt.....		944	454	196	914	1,130	3,638	90
Lake.....		720	427	404	869	1,014	3,434	85
Mendocino.....		712	319	278	784	939	3,032	75
Area 12.....		814	438	508	1,053	1,167	3,980	98
Butte.....		738	434	309	737	1,136	3,354	83
Colusa.....		1,148	510	961	2,016	1,237	5,872	145
Glenn.....		890	376	808	1,437	1,165	4,676	115
Tehama.....		774	451	575	1,074	1,222	4,096	101
Area 13.....		1,052	376	312	781	793	3,314	82
Lassen.....		1,064	383	221	757	854	3,279	81
Modoc.....		1,154	338	702	962	560	3,716	92
Plumas.....		946	410	126	681	1,027	3,190	79
Area 14.....		887	447	211	671	1,019	3,235	80
Shasta.....		827	462	137	656	1,309	3,391	84
Siskiyou.....		1,023	458	286	661	796	3,224	79
Trinity.....		645	256	155	857	1,033	2,946	73

* Per capita effective buying income based on net income and population of February 15, 1944, given in *Sales Management* May 10, 1946.

purchases and certain items used in agricultural production. The factor is thus weighted in the direction of potential selective buying by eliminating purchases of one of the necessities of life for everyone and purchases of a significant amount of necessities for one class, the farmers, who are expected to be especially interested in owning private planes.

The average of 1940 and 1945 per capita cash farm incomes shown in Table 40 are listed in Column 3. Gross cash farm income was given equal weight with the other economic factors in recognition of the greater than average utilization of private planes by agricultural interests.

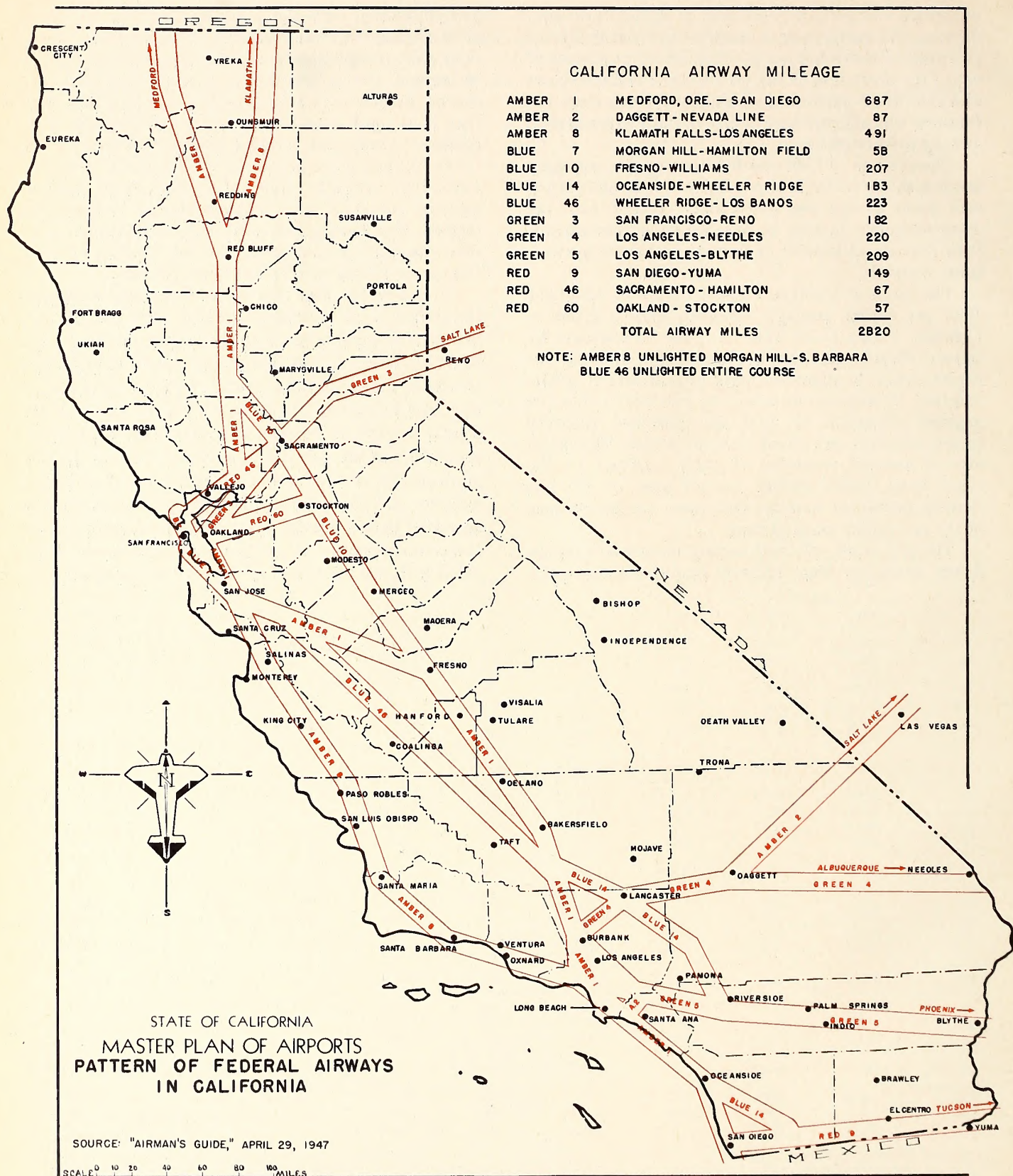
The totals of Column 4 are the mean of 1940 and 1945 per capita assessed valuation figures given in Columns 5 and 11 of Table 41. The assessments by county officials only were used in computing these per capita values to eliminate State assessments of public utilities. In developing a buying potential index the assessed valuation of land and personal property clearly measure individual residual wealth. The inclusion of assessed valuation of public utilities, on the other hand, would weight unduly some of the less densely populated counties and lessen the significance of the per capita computations.

The per capita effective buying income of Column 5 was developed from effective buying income totals

and population estimates published by *Sales Management* on May 10, 1946. This well-known index—based *inter alia* on bank debits, carloadings, nonfarm income of farmers, and agricultural marketing—has been constantly refined over a long period of years. The fact that it is used continuously by major business and industry is pragmatic proof of its dependability.

In Column 6 the preceding five economic factors—individual incomes, retail sales, gross farm income, assessed valuation, and effective buying income—are totaled. The buying potential index of Column 7 is then resolved by computing the relationship of each County and Area total to the State average.

It is believed that this index accurately measures the ability of the individuals of each Area and County to buy one economic commodity—private airplanes. An effort has been made to give proper weight to historical trends, to the impact and lasting effects of war production, and to current economic conditions. The possible special interest of farmers in private planes has been recognized in the selection of economic factors. In test applications of the buying index to localities where airport facilities were adequate and where there appeared to be a normal amount of air-mindedness, the theoretical number of private airplanes closely coincided with the number of aircraft by actual count.



PART IV — AERONAUTICAL APPRAISAL

1. AIRWAYS SYSTEM IN CALIFORNIA

The Federal Airways System is that highway system of the air which connects all principal cities of the United States. Established by the Federal Government in 1926, in the interest of safety and orderly control of cross-country flying, it has grown in twenty years from an initial system of 2,041 miles to a vast network of approximately 50,000 miles (Figure 1). The system includes:

- the familiar rotating beacon lights at regular intervals of approximately ten miles;
- the lighted intermediate landing fields at strategic points where commercial fields are not available;
- radio range stations to guide the airman on his course when visual reference to landmarks is impossible;
- radio marker stations of several types to provide positive fixes over specific geographical locations;
- radio voice transmitters to provide ground to air communication with all aircraft using the airways;
- instrument approach and landing systems at major air terminals to permit safe landings under conditions of restricted visibility;
- an extensive teletype system for the transmission of all data relating to traffic and weather;
- and finally, the complex system of central traffic control whereby all flights are conducted with adequate spacing and/or altitude separation particularly under conditions of reduced or no visibility.

This latter system includes some 25 airway traffic control centers at major cities throughout the country, each maintaining constant supervision and control over air traffic in its own particular segment of the airways and clearing flights into adjoining segments. The problems incident to this latter function of the Federal Airways System are extremely complex and are becoming increasingly so as traffic multiplies. Constant research and improvement, new equipment comparable to the block-signal system of the railroads, and better radio transmission through the use of very high frequencies are being applied on a national scale. In fact all phases of the airway problem demand that it be handled on a nationwide, if not international basis, since aircraft in flight know no political boundaries.

California is served by, and is the western terminus of, three major transcontinental airways designated Green 3, 4 and 5, and by the major north-south airway of western United States—Amber 1—connecting San Diego with Vancouver, B. C., plus numerous local air-

ways connecting nearly all of the principal cities of the State with each other and with the cities of neighboring states. Plate L illustrates the pattern of the Federal Airways serving California and indicates its general conformity to important surface transport routes—highways and railroads—which, through the past century, have come into being as the need for transportation within the State and with neighboring population centers developed. As pointed out in a previous section, the configuration of California and the location of its centers of population in its limited fertile and level land areas has established a pattern of commerce and transportation which governs air travel, as well as older forms of transportation. Study of the State Highway System (Plate H) and the Scheduled Airline Service Pattern (Plate O) together with Plate L, will show a striking similarity and indicate the inclusion of all of California's major population centers in each system.

The 2,820 miles of Federal Airways now established within the State adequately provide for at least 95% of intercity air traffic and leave but two secondary routes without the facilities afforded by the system. These routes are the direct Owens Valley route between Los Angeles, Reno and northeastern California points and the Coastal Route northward from San Francisco to Eureka and Oregon points. In both of these instances it may be assumed that when traffic warrants, suitable airways will be established.

It therefore appears that the airway needs of the State are adequately provided for at the present time and that there is little or no necessity for State Airways to supplement the Federal System.

There is need, however, for suitable emergency landing fields off the Federal Airways, in the mountainous terrain of California and western United States, along those natural routes of air travel which connect remote population groups or recreational areas with the principal centers with which they possess a community of interest. For example, Area 13, comprising the northeastern Modoc Plateau section of the State, is tributary to all of central California and the San Francisco Bay Region, but air traffic between these areas must of necessity traverse unbroken miles of mountainous and heavily wooded terrain, in which suitable emergency landing areas are a rarity. To bring the advantages of air travel to such isolated and remote sections with reasonable safety requires that a survey of this scope recognize the need, and recommend the minimum facilities necessary to such safety, which in turn are almost

invariably of value also as Forest Service landing fields, and for access to recreational regions.

Accordingly, in evaluating the airport need in the area treatments, consideration has been given in each case to the requirements for emergency-forest-recreational fields in the line of flight between all related population centers throughout the State. These in effect constitute a secondary system of airways which will provide vital facilities for the air traveler wherever his route may lie.

While the ultimate in safety might suggest a grid of airports covering the map, at specific intervals of ten or fifteen miles, it is recognized that such a plan is both impractical and impossible at this stage of aeronautical development. The obvious alternative is therefore suggested—sufficient multiple-purpose fields along the recognized routes of air travel between all major centers of population. Such a plan is neither impossible nor extravagant, when lives and property are in jeopardy, if aviation is to become genuinely useful to all of the people of the State and Nation.

One important adjunct of cross-country flight, particularly the type practiced by the average itinerant pilot—and one not provided by the Federal Airways System—is the adequate air-marking of cities and towns as an aid to air navigation. Such markings are to the airman what highway signs are to the motorist and simplify to a great extent the process of navigation for the unskilled owner of a private airplane. Years of effort and expense had provided a fair coverage of California cities with identification markings on roof-tops, gas holders and similar other large flat areas. All such markings became war casualties and were obliterated under military orders within the Western Defense Area which included most of California. There has been no united action to accomplish their replacement since the war's end. Active sponsorship of a program to adequately mark all cities and larger towns of California would prove a great boon to the private flyer and stimulate the use of private aircraft for business and pleasure throughout the State. Such a program is therefore recommended to those who may undertake the fulfillment of aviation's destiny in California.

2. AIRPORT INVENTORY

Sources

The first objective of this report has been to accurately inventory the existing airports within the State as to their location, classification and ownership, and wherever possible, to indicate the number of aircraft regularly based at each. Superficially this would appear to be a relatively simple task until it is pointed out that in this postwar period the airport pattern of the State is changing from day to day, while new private and commercial airports have appeared throughout the State, without the necessity for any coordination with State or local authorities. Moreover, to merely visit the 545 airports listed herein to obtain the minimum desired information would require at least 400 man-days of time which was not available to this staff.

Consultation of existing airport directories and the latest aeronautical charts quickly indicated many omissions and errors due to the postwar reconversion of municipal and county airports from wartime to peacetime uses, and the reopening of commercial airports in the Western Defense Area where civil aviation was greatly curtailed for the duration.

A questionnaire addressed to the airports of record received approximately 25% response while inquiries to local authorities produced similar results.

The Airport Section of the Civil Aeronautics Administration has endeavored, for several years, to maintain facility record cards on each airport of which it has knowledge. Such records are admittedly not current and are presently being revised in a six months program.

However, from this source, from the War Assets Administration, from the Aeronautical Inspectors of

the Civil Aeronautics Administration, from such county maps and Airport Master Plans as have been completed, from actual field survey wherever possible, and from all other available sources, there has been compiled this first reasonably complete and up to date list of airports with data as to their category, ownership, class and location. It is recognized that many private landing strips are omitted, but it is believed that the listing shows all of the public and commercial airports existing in California as of April 1, 1947.

Airports have been classified in accordance with the standards established by the Civil Aeronautics Administration which are outlined in Part V hereof, except that such standards have been more rigorously applied than in current airport listings. In order that this inventory may more nearly portray the actual status of existing airports, sub-standard airports in the several classes are listed as "S-1", "S-3", etc., whenever they are deficient in length or width of runway, all weather surfacing, lighting facilities, or any other known particular, the objective being to indicate more accurately than has ever been done, the shortcomings of the system of airports upon which we presently rely for aeronautical progress and development.

To further clarify the bases from which airports have been classified, it may be stated that the four categories of Military, Public, Commercial and Private, indicate a broad division of existing airports according to the phases of aeronautical activity served. Military airports of the Army, Navy or Marine Corps, with few exceptions, are unavailable to the every-day needs of civil aviation, while Public and Commercial airports are specifically intended to serve its requirements by

offering their facilities without restriction to all branches of civil aviation, and to Military aircraft in emergency. The fourth category of Private airports are those ordinarily providing a landing area intended for the personal use of the owner and his friends, and possessing no facilities for service to the itinerant aircraft. In applying this categorical description to existing airports, consideration has been given to the availability of such servicing facilities, and to the presence or absence of commercial flying activities, schools, or charter service at each location—the intent being, in each instance, to arrive at a list of airports which actually serve the aeronautical needs of the State. Obviously, strictly Private airports serve such needs only under emergency conditions; otherwise they would not remain “Private” airports. In applying these definitions, the latest available record of the use to which the airport was being put has been the determining factor.

Public airports are those sponsored or owned outright by divisions of government—municipalities, counties, irrigation districts, or divisions of State or National government, other than the military services. No distinction has been made as to whether the land is actually owned in fee by the governmental agency or merely leased by it, although such a supplemental breakdown is a necessary preliminary to participation

in the Federal Airport Program. Wherever the facility is maintained or controlled by a division of government for the convenience of civil aviation, the airport has been classed as *Public* in the following inventory. In a few instances county-owned airports which remain under lease to the military services have been classed as military fields, since they do not presently serve civil aviation.

Commercial airports are those provided by private capital, under private ownership, to serve the needs of civil aviation. The category includes all such airports as provide full service to itinerant aircraft, and at which commercial aviation activities, flying schools, or industrial activities are regularly conducted.

Under these definitions the following lists and Plates M-1 through M-14 provide a description and the general location of all Military, Public and Commercial airports of record in California as of April 1, 1947. Their number totals 456, of which 47 are Military, 202 Public, and 207 Commercial. Included also are 89 airports classed as Private, although this list is admittedly incomplete. In the following Section this list is analyzed quantitatively and qualitatively by Areas and Counties, to present all facets of the existing airport situation in California.

TABULATION OF EXISTING AIRPORTS
AREA 1—SAN DIEGO METROPOLITAN AREA

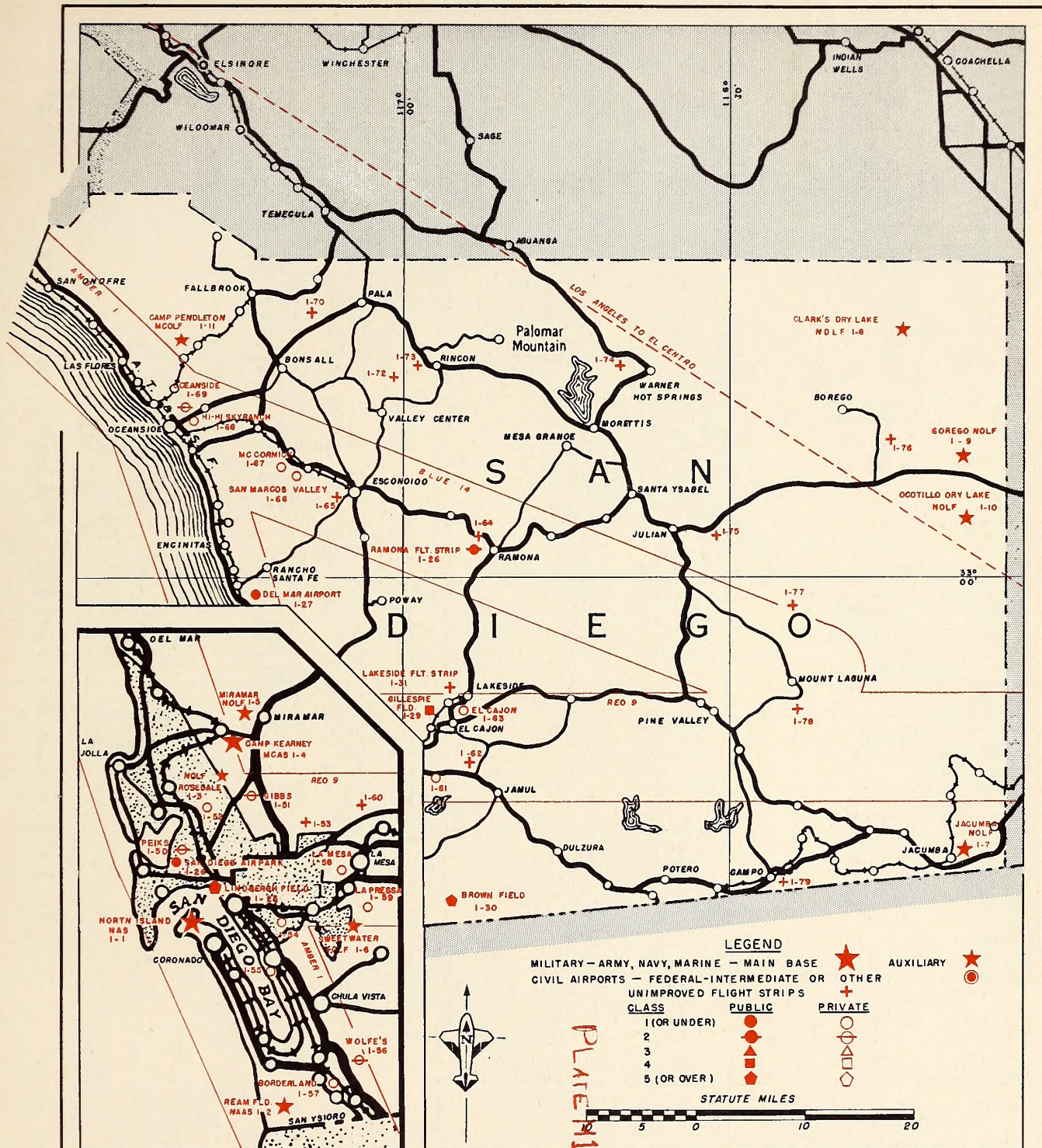
Airports Shown on Plate M-1

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
SAN DIEGO								
1-1	San Diego	North Island NAS	Military	U. S. Navy	5	2178	3.2 WSW San Diego	
1-2	San Ysidro	Ream Field NAAS	Military	U. S. Navy	4	2269	3.2 W San Ysidro	
1-3	San Diego	Rosedale NOLF	Military	U. S. Navy			6 N San Diego	
1-4	Miramar	Camp Kearney MCAS	Military	U. S. Navy	5	2177	10.7 N San Diego	
1-5	Miramar	Miramar NOLF	Military	U. S. Navy	1		1.0 N Miramar	
1-6	La Mesa	Sweetwater NOLF	Military	U. S. WAA	2		4 S La Mesa (Inactive)	
1-7	††Jacumba	Jacumba NOLF	Military	U. S. WAA	1	1704	1.5 S Jacumba (Inactive)	
1-8	††Borego	Clark's Dry Lake NOLF	Military	U. S. WAA	4		8 NNE Borego (Inactive)	
1-9	Borego	Borego NOLF	Military	U. S. Navy	1		12 ESE Borego	
1-10	Borego	Ocotillo Dry Lake NOLF	Military	U. S. Navy	1		15.5 SE Borego	
1-11	Oceanside	Camp Pendleton MCOLF	Military	U. S. Navy	5	1972	8 N Oceanside	
1-25	*San Diego	Lindbergh Field	Public	City of San Diego	8	2170	2.0 W San Diego	57
1-26	San Diego	San Diego Airpark	Public	City of San Diego	1	2171	5.0 NW San Diego	15
1-27	†Del Mar	Del Mar Airport	Public	County of San Diego	1	1501	1.1 NNE Del Mar	27
1-28	Ramona	Ramona Flight Strip	Public	County of San Diego	2		2.0 W Ramona	
1-29	Santee	Gillespie Field	Public	U. S. Navy	4	2268	1.0 SSW Santee (Leased to County)	
1-30	Otay	Brown Field	Public	U. S. Navy	5	2000	5.5 ESE Otay (Leased to County)	
1-31	Lakeside	Lakeside Flight Strip	Public	City of San Diego	1	1745	1.3 W Lakeside (Abandoned, Usable)	
1-50	San Diego	Peiks	Commercial	Private	S-2	2167	4.8 WNW San Diego	29
1-51	*San Diego	Gibbs	Commercial	Private	S-2	2166	7.0 NNE San Diego	64
1-52	San Diego	Hollingsworth	Commercial	Private	1		9.0 NNW San Diego (under construction)	
1-53	San Diego	Gillies Flight Strip	Private	Private			6.0 NE San Diego	
1-54	National City	Hawn Bros.	Commercial	Private	1		1.0 N National City	10
1-55	National City	South Bay	Commercial	Private	1	1935	1.1 SSW National City	18
1-56	Otay-Palm City	Wolfe's Airpark	Commercial	Private	S-2	2000.1	1.0 SE Otay	7
1-57	San Ysidro	Borderland	Commercial	Private	1	2227	1.5 WNW San Ysidro	11
1-58	La Mesa	Adams	Commercial	Private	1	1749	2.0 WSW La Mesa	21
1-59	La Mesa	La Pressa	Commercial	Private	1	1748	4.0 S La Mesa	36
1-60	La Mesa	Fletcher Flight Strip	Private	Private			4.0 N La Mesa	
1-61	La Mesa	Sweetwater Springs Air Ranch	Commercial	Private	1	1747	4.2 ESE La Mesa	7
1-62	La Mesa	Jamacha	Private	Private	1	1750	6.8 ESE La Mesa (Closed)	
1-63	El Cajon	El Cajon	Commercial	Private	1	1527	2.1 N El Cajon	34
1-64	Ramona	Ramona	Private	Private	S-1	2077	0.6 WNW Ramona	
1-65	*Escondido	Engel	Private	Private	1	1552	1.5 SW Escondido	11
1-66	San Marcos	San Marcos Valley	Commercial	Private	1		1.0 W San Marcos	8
1-67	San Marcos	McCormick	Commercial	Private	1	2213	2.0 W San Marcos	17
1-68	Oceanside	Hi Hi Sky Ranch	Commercial	Private	1		1.5 SE Oceanside	24
1-69	Oceanside	Oceanside Airport	Private	Private	S-2		1.5 NE Oceanside	4
1-70	Fallbrook	San Luis Rey Ranch	Private	Private	S-1		6 SSE Fallbrook	
1-71	Fallbrook	Shearer's Ranch	Private	Private	S-1			
1-72	Valley Center	Happy Land Sanitarium	Private	Private			4 NE Valley Center	
1-73	Rincon	Garrett Ranch	Private	Private	1		1 W Rincon	
1-74	Warners Hot Springs	Warners	Private	Private	S-2	2420	3.0 W Village	
1-75	Julian	Banner Flight Strip	Private	Private			4 E Julian	
1-76	Borego	Fletcher Flight Strip	Private	Private			4 SE Borego	
1-77	Vallecitos	Campbells Ranch	Private	Private			5 W Vallecitos	
1-78	Pine Valley	Morris Ranch	Private	Private			7 E Pine Valley	
1-79	Campo	Martins Flight Strip	Private	Private			1 E Campo	
Total of Record, San Diego County								400

* Included in 1947 National Airport Plan—6.

† Project pending in 1947 Program—2.

‡ Surplus military—Disposal pending—3.



STATE OF CALIFORNIA
MASTER PLAN OF AIRPORTS
AIRPORTS EXISTING MARCH 1947
AREA I

TABULATION OF EXISTING AIRPORTS
AREA 2—LOS ANGELES METROPOLITAN AREA

Airports Shown on Plate M-2

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
LOS ANGELES								
2-1	Newhall	CAA Site 3A	Public	U. S.-CAA	S-3	1944	2.2 NW Newhall	3
2-2	San Clemente Island	NAAS	Military	U. S. Navy	4	2163	8 From N. end of Island	
2-3	San Clemente Island	Castle NOLF	Military	U. S. Navy			At NW end of Island	
2-4	San Pedro	NAS	Military	U. S. Navy	4	2221	2.0 E San Pedro	
2-5	†Lancaster	Victory	Military	U. S.-WAA	2		10.2 NW Lancaster	
2-25	*Hawthorne	Municipal	Public	City of Hawthorne	4	1647	1.2 E Hawthorne	30
2-26	Lancaster	War Eagle	Public	Co. of Los Angeles	2	1753	5.0 W Lancaster	18
2-27	Llano	Grey Butte	Public	Co. of Los Angeles	2	1781	10.5 ENE Llano	
2-28	Long Beach	Daugherty	Public	City of Long Beach	6	1794	3.0 NE Long Beach	140
2-29	*Los Angeles	Mines	Public	City of Los Angeles	4	1818	12.5 SW Los Angeles	75
2-30	*Palmdale	(AA Field)	Public	Palmdale Irri. Dist.	6	2013	3.0 NE Palmdale	
2-31	Rosamond	Liberty	Public	Co. of Los Angeles	2	2117	4.1 S Rosamond	
2-32	*Santa Monica	Clover	Public	City of Santa Monica	4	2253	2.6 ESE Santa Monica	75
2-33	Torrance	Lomita Flight Strip	Public	City of Torrance	4	1786	2.5 SSW Torrance	75
2-50	Artesia	Cranford	Commercial	Private	S-2	1262	2.1 NE Artesia	12
2-51	Avalon	Buffalo Springs	Commercial	Private	2	1276	7.0 NW Avalon	
2-52	Bellflower		Commercial	Private	1	1311	1.2 NE Bellflower	33
2-53	Burbank	Lockheed	Commercial	Private	5	1353	3.5 WNW Burbank	75
2-54	Canoga Park	Reese	Private	Private	S-1		Canoga Park	3
2-55	Castaic	Forst	Private	Private	S-2		0.5 E Castaic	1
2-56	Compton	Central	Commercial	Private	2	1433	2.0 NW Compton	150
2-57	Compton		Commercial	School Board	S-2	1434	1.5 SW Compton	150
2-58	Culver City		Commercial	Private	S-2	1473	2.0 S Culver City	135
2-59	Culver City	Hughes	Private	Private	7	1474	3.6 SSW Culver City	
2-60	Downey	Vultee	Private	Private	3	1518	1.5 SSE Downey	
2-61	*El Monte		Commercial	Private	1	1539	1.0 NNE El Monte	40
2-62	El Monte	Rosemead	Commercial	Private	2	1540	1.0 W El Monte	105
2-63	Gardenia Valley	Western Ave.	Commercial	Private	1	1603	2.0 NW Gardenia	150
2-64	Glendale	Grand Central	Commercial	Private	3	1611	2.2 NW Glendale	105
2-65	Lancaster		Commercial	Private	1	1752	0.5 NW Lancaster	20
2-66	Lancaster	Antelope Valley	Commercial	Private	1	1754	3.4 S Lancaster	6
2-67	Lancaster	Quartz Hill	Commercial	Private	1		6.5 WSW Lancaster	15
2-68	Lancaster	Sterk's Ranch	Private	Private	S-2		2.5 ENE Lancaster	
2-69	Monrovia		Commercial	Private	S-2	1902	0.5 SE Monrovia	70
2-70	*Montebello		Commercial	Private	2	1908	2.0 SSW Montebello	80
2-71	Montebello	Vail	Commercial	Private	2	1909	1.5 SW Montebello	219
2-72	Northridge	Neggins	Commercial	Private	1		0.5 N Northridge	
2-73	Norwalk	Delpert	Commercial	Private	1	1962	2.0 W Norwalk	25
2-74	Palmdale	Galbraith	Commercial	Private	S-1	2014	0.3 W Palmdale	4
2-75	Pomona		Commercial	Private	1	2058	1.8 SSE Pomona	30
2-76	Pomona	Brackett	Commercial	Private	1	2059	3.0 NW Pomona	20
2-77	Puente	Sky Ranch	Commercial	Private	S-2	2067	1.3 E Puente	30
2-78	*San Fernando	Weightman	Commercial	Private	S-2	2184	1.2 E San Fernando	70
2-79	San Fernando	Whiteman	Commercial	Private	2	2185	2.0 SE San Fernando	230
2-80	Saugus	Schmidt Bros.	Commercial	Private	1		5.0 E Saugus	4
2-81	Torrance	Community	Commercial	Private	1		3.0 NW Torrance	40
2-82	Van Nuys	Metropolitan	Commercial	Private	5	2396	3.0 NW Van Nuys	160
2-83	Wilmington	Harbor	Commercial	Private	S-1	2462	1.0 W Wilmington	
Total of Record, Los Angeles County								2,398
ORANGE								
2-6	El Toro	MCAB	Military	U. S. Navy	6	1546	3.7 NW E. Toro	
2-7	Los Alamitos	NAAS	Military	U. S. Navy	5	1796	1.0 SE Los Alamitos	
2-8	Haster Farm	NOLF	Military	U. S. Navy	S-1		2.0 SW Garden Grove	
2-9	Mile Square	NOLF	Military	U. S. Navy	2	2440	3.5 WSW Santa Ana	
2-10	Palisades	NOLF	Military	U. S. Navy	1	1455	2.0 E Costa Mesa	
2-11	Santa Ana	NAS-LTA	Military	U. S. Navy	1	2228	3.6 SE Santa Ana	
2-36	†Fullerton	Municipal	Public	City of Fullerton	1	1593	3.0 W Fullerton	30
2-37	*Huntington Beach	Municipal	Public	City of Huntington Beach	1	1676	1.8 SE Huntington Beach	8
2-38	Santa Ana	Orange County	Public	County of Orange	4	2230	5.0 S Santa Ana	70
2-101	Anaheim			Private	1		Anaheim	2
2-102	Anaheim	Post Bros.		Private	1		Anaheim	6
2-103	Buena Park	Knotts	Commercial	Private	1	1351	2.0 SW Buena Park	
2-104	Costa Mesa	Newport Sky Harbor	Commercial	Private	S-2	1455.1	1.3 WNW Costa Mesa	12
2-105	Cypress		Commercial	Private	1		1.5 E Cypress	
2-106	La Habra	Imperial Ranch		Private	2		La Habra	
2-107	San Juan Capistrano		Commercial	Private	S-1	2206	1.5 SSW San Juan Capistrano	8
2-108	Sunset Beach		Commercial	Private	S-1		NE Sunset Beach	6
Total of Record, Orange County								142

Concluded on Page 106.



TABULATION OF EXISTING AIRPORTS

AREA 2—LOS ANGELES METROPOLITAN AREA—Continued

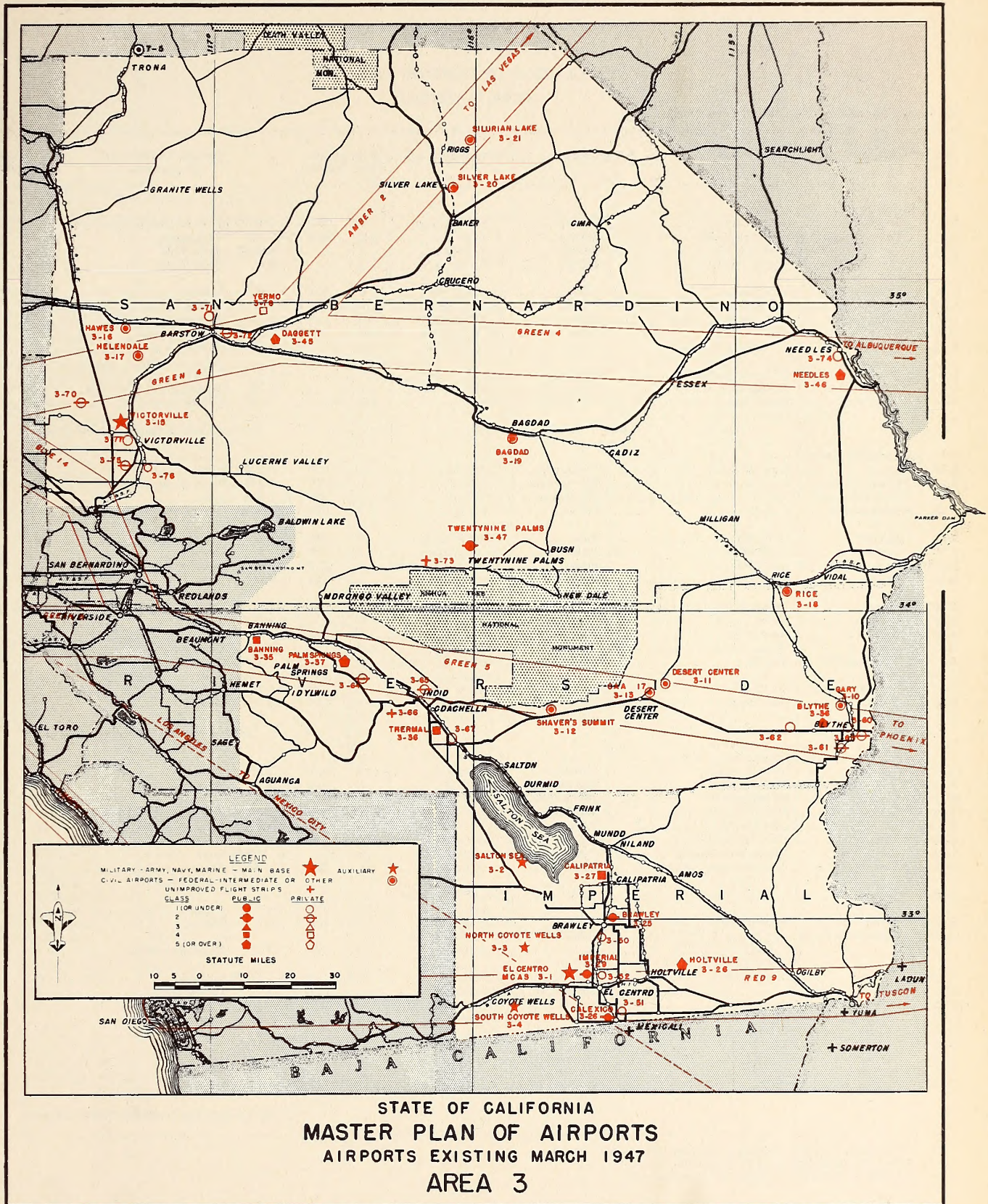
Airports Shown on Plate M-2 (Page 105)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
	RIVERSIDE (Western)							
2-15	Riverside	March AA Base	Military	U. S. Army	6	2115	8.8 SE Riverside	
2-16	†Hemet	Ryan D.P.C.	War Surplus	U. S.-WAA	1	1654	2.5 WSW Hemet	4
2-17	†Hemet	Ryan Auxiliary No. 1	War Surplus	U. S.-WAA	1	1655	4.2 NW Hemet	
2-120	Calimesa		Commercial	Private				
2-121	Corona		Commercial	Private	1	1447	2.3 ESE Corona	10
2-122	Elsinore	Elsinore	Commercial	Private	S-2	1543	1/0 SSE Elsinore	4
2-123	Elsinore	Lake Elsinore	Commercial	Private	S-1	1544	4/0 SSE Elsinore	
2-124	Glen Ivy		Commercial	Private				1
2-125	Hemet	Ramona	Commercial	Private	1	1656	4.6 ESE Hemet	
2-126	Norco		Commercial	Private	S-1	1955	2.5 N Corona	4
2-127	Riverside	Arlington	Commercial	Private	S-2	2112	4.5 WSW Riverside	25
2-128	Riverside	W. Riverside	Commercial	Private	2	2113	2.3 WNW Riverside	30
2-129	San Jacinto	Harmon	Commercial	Private	1		1.2 S San Jacinto	10
							Total of Record, Riverside County (Western)	88
	SAN BERNARDINO (Southwestern)							
2-20	San Bernardino	Army Air Depot	Military	U. S. Army	6	2154	3.5 ESE San Bernardino	
2-21	†Chino	Cal. Aero (DPC)	War Surplus	U. S.-WAA	4	1398	4.5 SE Chino	
2-45	*Fontana	(Cal. Aero. Auxiliary)	Public	Co. of San Bernardino	1		2.0 WNW Fontana	
2-46	*Ontario	International (AA Field)	Public	City of Ontario	5	1986	2.0 E Ontario	35
2-140	*Big Bear City		Commercial	Private	S-1	1323	0.5 NW Big Bear City	6
2-141	Claremont	Cable	Commercial	Private	1	1404	1.8 ENE Claremont	32
2-142	Fontana	Leach	Commercial	Private	1		3.0 ENE Fontana	5
2-143	Redlands	(Mentone)	Commercial	Private	1		1.0 NE Redlands	4
2-144	*Rialto	Morrow	Commercial	Private	2	2102	1.8 S Rialto	30
2-145	San Bernardino	Warren & Day	Commercial	Private	2	2149	4.7 NNW San Bernardino	35
2-146	San Bernardino	Tri-City	Commercial	Private	S-2	2152	3.3 SSE San Bernardino	20
							Total of Record, San Bernardino County (Southwestern)	167

* Included in 1947 National Airport Plan—13.

† Project pending in 1947 Program—1.

‡ Surplus military—Disposal pending—4.



TABULATION OF EXISTING AIRPORTS

AREA 3—DESERT

Airports Shown on Plate M-3 (Page 107)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
IMPERIAL								
3-1	*El Centro	MC Air Station	Military	U. S. Navy Lease	6	1530	7.0 WNW El Centro (Leased from County)	
3-2	Westmorland	Salton Sea NAAS	Military	U. S. Navy	S-3	2442	16.0 NW Westmorland	
3-3	Coyote Wells No. 1	(North) NOLF	Military	U. S. Navy	2		13.0 NNE Coyote Wells	
3-4	Coyote Wells No. 2	(South) NOLF	Military	U. S. Navy	1		3.0 E Coyote Wells	
3-25	†*Brawley	Municipal	Public	City of Brawley	S-2	1342	1.3 NE Brawley	6
3-26	†*Calxico	Municipal	Public	City of Calxico	2		1.2 W Calxico	4
3-27	†*Calipatria	Municipal	Public	City of Calipatria	S-4	1363	0.5 W Calipatria	20
3-28	Holtville	(NOLF)	Public	Co. of Imperial	5	1671	7.5 ENE Holtville	
3-29	*Imperial		Public	Co. of Imperial	S-2	1683	1.0 SSW Imperial	42
3-50	Brawley	O'Connell Bros.	Commercial	Private	S-1		0.3 S Brawley	8
3-51	Calxico	Gunterman	Commercial	Private	1		2.0 NE Calxico	
3-52	Imperial	Baxter Bros.	Commercial	Private	S-1		1.0 SE Imperial	12
Total of Record, Imperial County								92
RIVERSIDE (Desert)								
3-10	†Blythe	Gary (Morton)	War Surplus	U. S.-WAA	2	1337	5.0 NNW Blythe	
3-11	†*Desert Center	AA Field	War Surplus	U. S.-WAA	4	1507	5.0 NE Desert Center (Closed)	
3-12	†Shavers Summit	AA Field	War Surplus	U. S.-WAA	5	1689	29.5 ESE Indio	
3-13	Desert Center	CAA Site No. 17	Public	U. S.-CAA	S-3	1506	1.0 ENE Desert Center	
3-35	*Banning	Municipal	Public	City of Banning	4	1297	1.0 SE Banning	15
3-36	*Blythe	(AA Field)	Public	Co. of Riverside	6	1336	7.2 W Blythe	
3-37	*Palm Springs	(AA Field)	Public	City of Palm Springs	6	2017	2.5 E Palm Springs	
3-38	Thermal	(AA Field)	Public	City of Indio	4	2352	1.8 SW Thermal	
3-60	Blythe	Bresson	Commercial	Private	1		1.9 W Blythe	11
3-61	Blythe	Ripley	Commercial	Private	2		6.0 SSW Blythe	
3-62	Blythe	Harvey	Commercial	Private	1	1335	13.5 W Blythe	5
3-63	Blythe	Heron	Commercial	Private	S-2	1338	1.2 E Blythe	35
3-64	Cathedral City	Airpark	Commercial	Private	2		E Cathedral City	
3-65	Indio		Commercial	Private	2	1688	0.8 NNE Indio	25
3-66	La Quinta		Private	Private	1	1755	0.3 SE La Quinta	
3-67	Mecca	Port Mecca	Commercial	Private	S-1	1881	1.4 WNW Mecca	
Total of Record, Riverside County (Desert)								91
SAN BERNARDINO (Desert)								
3-15	Victorville	Army Air Field	Military	U. S. Army	6	2407	6.0 NW Victorville	
3-16	†Hawes	Auxiliary No. 1	War Surplus	U. S.-WAA	4	1667	27.5 N Victorville	
3-17	†Helendale	Auxiliary No. 2	War Surplus	U. S.-WAA	4	1652	20 N Victorville	
3-18	†Rice	Army Air Field	War Surplus	U. S.-WAA	5	2105	2.3 ESE Rice	
3-19	Bagdad	CAA Site No. 16	Public	U. S.-CAA	S-3	1285	1.0 S Bagdad	
3-20	Silver Lake	CAA Site No. 18	Public	U. S.-CAA	S-3	1288	5.5 N Baker	
3-21	Baker	Silurian Lake Soaring	Public	Public Domain	(Dry Lake)	15	NNW Baker	
(7-5)	Trona	(Airport in Inyo County)	Public	U. S.-CAA	S-5	2363	5 NE Trona	8
3-45	Daggett		Public	Co. of San Bernardino	5	1479	5.0 E Daggett	2
3-46	Needles	Municipal	Public	City of Needles	5	1938	5.5 S Needles	
3-47	Twenty-nine Palms		Public	Co. of San Bernardino	2	2380	4.8 N Twenty-nine Palms	
3-70	Adelanto	Mirage Lake	Private	Private	2	1215	10 WNW Adelanto	
3-71	Barstow		Commercial	Private	1	1300	1.8 N Barstow	6
3-72	Barstow	Air Ranch	Private	Private	2		E Barstow	1
3-73	Joshua Tree	"K" Field	Private	Private	S-1		10 W Twenty-nine Palms	4
3-74	Needles	Riverview	Commercial	Private	1	1939	1.4 S Needles	8
3-75	Victorville	66	Commercial	Private	S-2	2408	5.2 SSW Victorville	4
3-76	Victorville	Hesperia	Commercial	Private	S-1			2
3-77	West Victorville		Commercial	Private	1		W Victorville	4
3-78	Yermo	Calico	Commercial	Private	S-4	2490	2.1 N Yermo	2
Total of Record, San Bernardino County (Desert)								41

* Included in 1947 National Airport Plan—9.

† Project pending in 1947 Program—3.

‡ Surplus military—Disposal pending—6.

TABULATION OF EXISTING AIRPORTS
AREA 4—KERN COUNTY

Airports Shown on Plate M-4-6 (Page 113)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
KERN								
4-1	Bakersfield	Minter Army Air Field	Military	U. S. Army	3	1292	13.5 NW Bakersfield	
4-2	†Pond	Minter Auxiliary No. 2	War Surplus	U. S. WAA	2		1.5 SW Pond	
4-3	†Famoso	Minter Auxiliary No. 3	War Surplus	U. S. WAA	2		2.7 N. Famoso	
4-4	†Dunlap	Minter Auxiliary No. 4 (Jasmine)	War Surplus	U. S. WAA	2		4 SSE Richgrove	
4-5	†Semi-Tropic	Minter Auxiliary No. 5	War Surplus	U. S. WAA	2		8.6 W Wasco	
4-6	†Poso	Minter Auxiliary No. 6	War Surplus	U. S. WAA	2		4 E Famoso	
4-7	Inyokern	Armitage Field	Military	U. S. Navy	6		7 ENE Inyokern	
4-8	Inyokern	Harvey Naval Air Field	Military	U. S. Navy Lease	6	1695	0.5 WNW Inyokern (Leased from Co.)	
4-9	Mojave	Marine Corps Air Station	Military	U. S. Navy Lease	4	1899	0.7 E Mojave (Leased from Co.)	
4-10	Muroc	Muroc Army Air Field	Military	U. S. Army	6	1930	1.7 S Muroc	
4-11	Muroc	Muroc Army Flight Test	Military	U. S. Army	9	1931	4.5 N Muroc	
4-12	†Taft	Gardner Army Air Field	War Surplus	U. S. WAA	5	2339	9.5 ESE Taft	
4-13	†Parker	Gardner Auxiliary No. 1	War Surplus	U. S. WAA	2		15.6 ESE Taft	
4-14	†Kern	Gardner Auxiliary No. 2	War Surplus	U. S. WAA	4		21.5 ESE Taft	
4-15	†Allen	Gardner Auxiliary No. 3	War Surplus	U. S. WAA	2		26.2 ESE Taft	
4-25	*Bakersfield	Municipal	Public	Co. of Kern	5	1291	4.5 NNW Bakersfield	148
4-26	Bakersfield No. 2		Public	Co. of Kern	1	1290	6 SSE Bakersfield	
4-27	*Buttonwillow		Public	Co. of Kern	S-1		1 N Buttonwillow	
4-28	*Delano		Public	Co. of Kern	5	1497	2.0 SSE Delano	16
4-29	Inyokern	(Lease to U.S.N. - Harvey N.A.S.)						
4-30	Kernville		Public	Co. of Kern	S-1	1710	1.2 ESE Kernville	
4-31	Lebec		Public	Co. of Kern	S-1		0.5 S Lebec	
4-32	Lost Hills		Public	Co. of Kern	4	1845	1 N Lost Hills	
4-33	Maricopa		Public	Co. of Kern	1	1863	0.7 S Maricopa	
4-34	Mojave	(Under Lease to U.S.N.—See Mojave M.C. A. S.)						
4-35	McKittrick		Public	Co. of Kern	1		2.0 NW McKittrick	
4-36	Randsburg		Public	Co. of Kern	S-1	2079	1.8 NE Randsburg	
4-37	†Shafter		Public	Co. of Kern	1	2293	3.3 SSE Shafter	
4-38	*Taft		Public	Co. of Kern	2	2338	0.6 E Taft	22
4-39	Taft No. 2	Conner's	Public	Co. of Kern	2	2337	7.2 ESE Taft	
4-40	†Tehachapi		Public	Co. of Kern	3	2341	1.0 N Tehachapi	3
4-41	†Wasco		Public	Co. of Kern	S-2	2422	2 NNW Wasco	6
4-50	Bakersfield	Rudnick Air Park	Commercial	Private	2		4 S Bakersfield	16
4-51	Bakersfield	La Cresta	Commercial	Private	3		2 NE Bakersfield	22
4-52	Bakersfield	Pumpkin Center	Commercial	Private	1		8 SSW Bakersfield	4
4-53	Bakersfield	Bowhay Ranch	Private	Private	1		7 ENE Bakersfield	
4-54	Bodfish	Scovern's Hot Springs	Private	Private	1	1339	2 NE Bodfish	
4-55	Boron	Boron	Private	Private	1	1340.5	1 N Boron	2
4-56	Inyokern	Drummond Hospital	Private	Private	S-1		7 E Inyokern	
4-57	Inyokern	Helm Field	Private	Private	S-1		1 SW Inyokern	6
4-58	Inyokern	Ridgecrest	Commercial	Private	2		7 E Inyokern	17
4-59	Rosamond	Rancho Oro Verde	Private	Private	S-2	2116	11 E Rosamond	6
4-60	Rosamond	White Oak Lodge	Private	Private	S-1		20 WNW Rosamond	
4-61	Weed Patch	Weed Patch	Private	Private	S-1		2 SSW Weed Patch	3
4-62	Weed Patch	Sunset School	Private	Private	S-1		1 SW Weed Patch	4
4-63	Wheeler Ridge		Private	Private	S-1		5 E Wheeler Ridge	
4-64	Taft	Valley Acres	Private	Private	S-1		7.5 NE Taft	
Total of Record, Kern County								275

* Included in 1947 National Airport Plan—7.

† Project pending in 1947 Program—3.

‡ Surplus military—Disposal pending—9.

CALIFORNIA AIRPORTS

TABULATION OF EXISTING AIRPORTS

AREA 5—MIDCOASTAL AREA

Airports Shown on Plate M-5

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
VENTURA								
5-1	San Nicolas Island	NOLF	Military	U. S. Navy	S-5	2220	36. S Ventura	
5-2	Point Mugu	NAAS	Military	U. S. Navy	5		6.5 SE Oxnard	
5-25	*Oxnard	Ventura County	Public	Co. of Ventura	4	2001	1.0 W Oxnard	90
5-26	*Oxnard	Flight Strip	Public	Co. of Ventura	4	2002	5.5 E Oxnard	
5-50	Camarillo	Conejo Valley	Commercial	Private	S-2		9.5 ESE Camarillo	10
5-51	Camarillo	Hidden Valley	Private	Private	S-2		8.5 SE Camarillo	1
5-52	Santa Susana		Commercial	Private	1	2261	0.5 S Santa Susana	10
5-53	Piru	Camulos Ranch	Private	Private	S-2		1.5 SE Piru	
5-54	*Fillmore		Commercial	Private	1		1.0 S Fillmore	4
5-55	Bardsdale		Private	Private	S-2		1.5 W Bardsdale	
5-56	*Santa Paula	Bassett	Commercial	Private	1	2256	0.8 S Santa Paula	30
5-57	Santa Paula	Harvey	Commercial	Private	S-2		3.0 E Santa Paula	10
5-58	Saticoy		Commercial	Private	S-2	2279	1.5 S Saticoy	1
5-59	Ojai	Henderson	Commercial	Private	S-1	1981	3.5 WSW Ojai	10
5-60	Ojai	Santa Ana Valley	Private	Private	1		6.0 SW Ojai	1
Total of Record, Ventura County								167
SANTA BARBARA								
5-5	Lompoc	Camp Cook Flight Strip	Military	U. S. Army	2		8.5 NW Lompoc	
5-6	Maricopa	Cuyama Valley	Public	U. S. F. S.	1	1864	16 SSW Maricopa	
5-30	*Santa Barbara	Municipal	Public	City—Santa Barbara	4	2235	8.1 W Santa Barbara	60
5-31	Santa Maria (AAB)		Public	Co. of Santa Barbara	4		3.7 S Santa Maria	
5-32	*Lompoc	Airpark (N-LTA)	Public	Co. of Santa Barbara	S-1	1788	0.6 N Lompoc	7
	†*Los Alamos	(Proposed)	Public	Co. of Santa Barbara	(1)			
	†*Santa Ynez	(Proposed)	Public	Co. of Santa Barbara	(2)			
	†*Carpinteria	(Proposed)	Public	Co. of Santa Barbara	(1)			
5-70	Santa Ynez	Crawford Ranch	Private	Private	S-1	2263	4.2 ESE Santa Ynez	2
5-71	Santa Ynez	Keck Ranch	Private	Private	1		2.5 N Santa Ynez	2
5-72	Solvang	Buelton	Private	Private	1		1.7 WNW Solvang	2
5-73	Santa Maria	Hancock	Commercial	Private	2	2250	1.0 SE Santa Maria	100
5-74	Santa Maria	Machado	Commercial	Private	1		2.0 N Santa Maria	8
5-75	Lompoc		Commercial	Private	1	1789	2.5 N Lompoc	5
Total of Record, Santa Barbara County								186
SAN LUIS OBISPO								
5-35	San Luis Obispo	California Poly	Public	State of California	S-2		1.5 N San Luis Obispo	6
5-36	†*San Luis Obispo	County-(NOLF)	Public	Co.—San Luis Obispo	3	2211	2.0 SSE San Luis Obispo	20
5-37	Paso Robles	Estrella (AAFld.)	Public	Co.—San Luis Obispo	4	2032	4.5 NE Paso Robles	
5-38	Paso Robles	Sherwood	Public	City of Paso Robles	2	2034	2.7 ESE Paso Robles	40
5-80	Nipomo	Dorman's	Commercial	Private	1		3.0 SE Nipomo	10
5-81	*Morro Bay		Commercial	Private	S-1		1.5 ENE Morro Bay	4
5-84	*Cambria		Private	Private	S-1	1368	0.6 SSW Cambria	
5-85	San Simeon	Hearst Ranch	Private	Private	1	2226	0.8 NNE San Simeon	
5-86	Paso Robles	Hillman Ranch	Private	Private	1	2031	10.0 ENE Paso Robles	
5-87	Creston	Quintana Ranch	Private	Private	S-1		2 S Creston	1
5-88	Soda Lake	Arnold Ranch	Private	Private	1		4 SW Soda Lake	1
Total of Record, San Luis Obispo County								82
MONTEREY								
5-15	†Watsonville	(NAAF-LTA)	Military	U. S. WAA	S-1	2428	3.8 SSW Watsonville	
5-40	*Salinas	Municipal (AAFld.)	Public	City of Salinas	4	2137	2.5 ESE Salinas	50
5-41	*Monterey	Peninsula (NAAS)	Public	Airport District	4	1941	3.4 ESE Monterey	35
5-42	*King City	Municipal (NAAS)	Public	City of King City	3	1713	1.5 NNE King City	15
5-90	*San Ardo		Private	Private	S-1		1.0 NW San Ardo	
5-91	Carmel	Carmel Valley	Commercial	Private	S-2	1377	12.5 ESE Carmel	
5-92	King City	Kathy	Commercial	Private	1		0.3 SW King City	
Total of Record, Monterey County								100
SANTA CRUZ								
5-45	*Watsonville	Municipal (NAAS)	Public	City of Watsonville	4	2429	2.6 NW Watsonville	17
	†*Santa Cruz	Municipal (Proposed)	Public	City of Santa Cruz	(1)			
5-95	Santa Cruz Airport		Commercial	Private	1	2241	4.8 E Santa Cruz	18
5-96	Santa Cruz	Sky Park	Commercial	Private	1	2243	5.3 N Santa Cruz	9
5-97	Boulder Creek		Commercial	Private	1	1341	3.0 NW Boulder Creek	
Total of Record, Santa Cruz County								44
SAN BENITO								
5-48	*Hollister	Municipal (NOLF)	Public	City of Hollister	3	1668	2.9 N Hollister	14

* Included in 1947 National Airport Plan—19.

† Project pending in 1947 Program—5.

‡ Surplus military—Disposal pending—1.



CALIFORNIA AIRPORTS

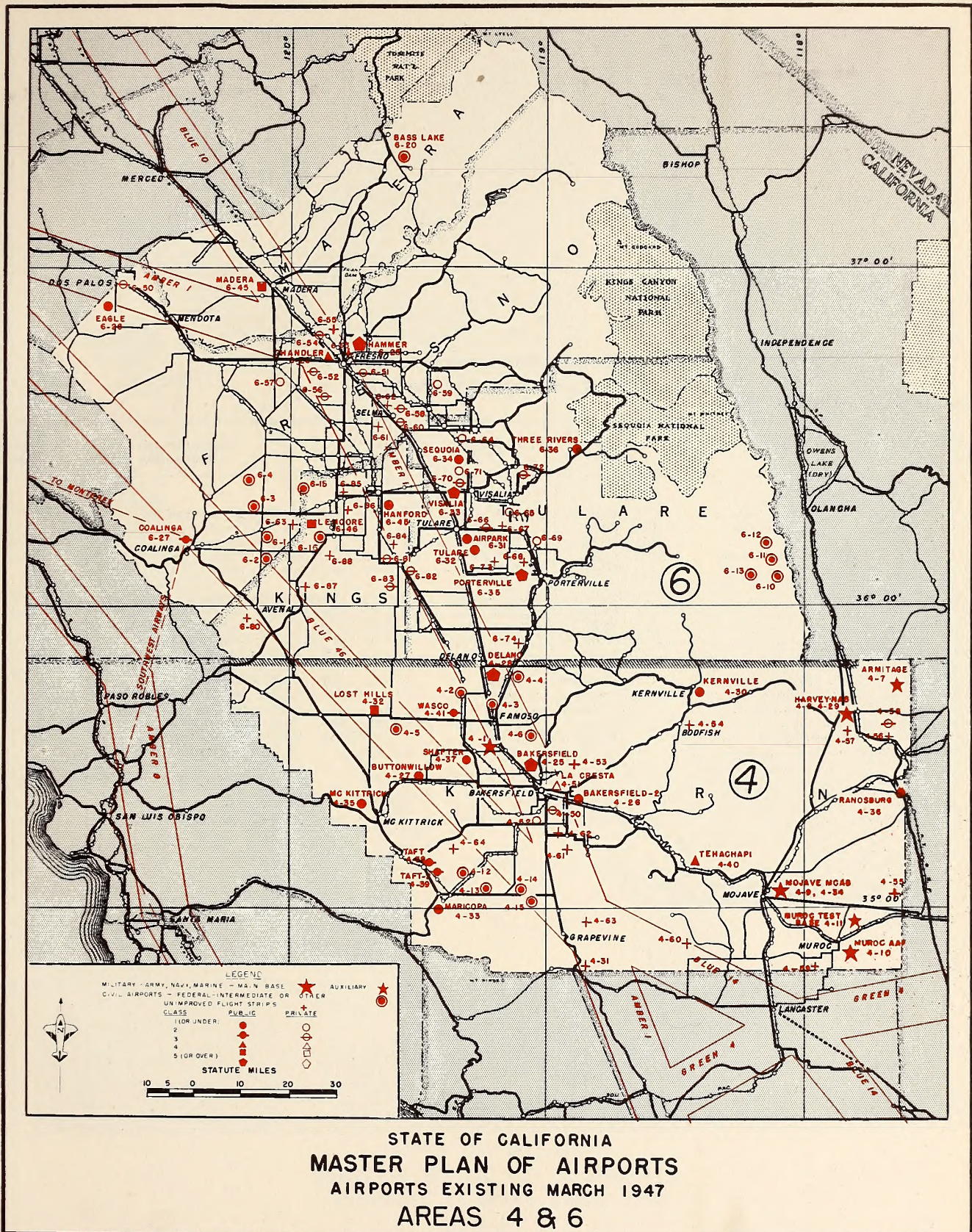
TABULATION OF EXISTING AIRPORTS
AREA 6—FRESNO METROPOLITAN AREA

Airports Shown on Plate M-4-6

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
FRESNO								
6-1	†Huron	Huron Auxiliary	War Surplus	U. S. WAA	2		2.5 ENE Huron	
6-2	†Huron	Indian Auxiliary	War Surplus	U. S. WAA	2		5.4 S Huron	
6-3	†Huron	West Auxiliary	War Surplus	U. S. WAA	2		6.0 NW Huron	
6-4	†Helm	Helm Auxiliary	War Surplus	U. S. WAA	2		13.0 SSW Helm	
6-25	Fresno	Hammer	Public	City of Fresno	6	1591	4.8 NE Fresno	
6-26	*Fresno	Chandler	Public	City of Fresno	3	1590	1.8 W Fresno	61
6-27	Coalinga		Public	City of Coalinga	S-2	1419	1.5 N Coalinga	14
6-28	*Dos Palos	Eagle	Public	City of Dos Palos	1	1515	6.5 SW Dos Palos	11
6-50	Dos Palos	Ora Loma	Commercial	Private	S-2	1516	1.6 SE Dos Palos	
6-51	Fresno	Adams	Commercial	Private	2	1591.3	4.0 SE Fresno	24
6-52	Fresno	Belmont	Commercial	Private	S-2	1591.1	6.0 W Fresno	15
6-53	Fresno	Cannon	Private	Private	1	1591.2	2.0 N Fresno	3
6-54	Fresno	Furlong	Commercial	Private	S-2	1589	5.5 NW Fresno	28
6-55	Fresno	Sierra Sky Park	Private	Private	S-2		9.0 NW Fresno	
6-56	Fresno	Sky Lark	Commercial	Private	2	1591.4	8.5 SSW Fresno	6
6-57	Kerman	Bland	Commercial	Private	1		15.0 W Fresno	1
6-58	Parlier	Intercity	Commercial	Private	S-2	2027	1.5 WSW Parlier	16
6-59	Reedley	Great Western	Commercial	Private	1	2099	5.0 N Reedley	9
6-60	Selma	Norsigian	Commercial	Private	S-2		2.4 E Selma	8
6-61	Selma	Palomino	Private	Private	1		6.0 SSW Selma	2
6-62	Selma	Kleinhammer	Private	Private	S-1		3.0 NE Selma	
6-63	Westhaven	Boston Land	Private	Private	S-2	2437	1.7 SSE Westhaven	
Total of Record, Fresno County								198
TULARE								
6-10	Monache Meadows		Federal	U. S. F. S.	S-1	1982	10.8 WSW Olancho	
6-11	Templeton Meadows		Federal	U. S. F. S.	S-1	1983	12.0 W Olancho	
6-12	Tunnel Meadows		Federal	U. S. F. S.	S-1	1984	16.5 WNW Olancho	
6-13	Kern Canyon		Federal	U. S. F. S.	S-1		16.0 ENE Camp Nelson	
6-31	†*Tulare	Airpark	Public	Co. of Tulare	1	2371	3.0 SSE Tulare	28
6-32	Tulare	Rankin Academy	Public	Co. of Tulare	1	2372	6.0 SE Tulare	34
6-33	*Visalia		Public	City of Visalia	5	2413	5.0 W Visalia	
6-34	Visalia	Sequoia	Public	Co. of Tulare	1	2414	8.5 NNW Visalia	
6-35	*Porterville		Public	City of Porterville	5	2062	3.8 SW Porterville	14
6-36	†*Three Rivers		Public	Co. of Tulare	S-1	2352	2.2 NNE Three Rivers	
	†*Pixley	(Proposed)	Public	Co. of Tulare	(1)			
	†*Orange Cove	(Proposed)	Public	Co. of Tulare	(1)			
6-64	Dinuba	Alta	Commercial	Private	1		3.5 E Dinuba	15
6-65	*Exeter	Lindsey	Commercial	Private	1		3.0 S Exeter	
6-66	Lindsey	Colburn	Commercial	Private	S-2	1777.1	4.7 W Lindsey	
6-67	Lindsey	Pruner	Private	Private	1	1777	3.2 WNW Lindsey	4
6-68	Porterville	Fuller	Private	Private	S-2	2061	2.4 SSW Porterville	
6-69	*Strathmore	Traugher	Commercial	Private	1	2321	2.0 N Strathmore	2
6-70	Visalia	Green Acres	Commercial	Private	S-2	2415	1.5 NW Visalia	37
6-71	Visalia	Piegrass	Commercial	Private	1	2412	3.7 NW Visalia	9
6-72	*Woodlake		Commercial	Private	S-2	2463.5	2.6 ESE Woodlake	5
6-73	Woodville	Vossler	Private	Private	1	2469	1.3 E Woodville	
6-74	Richgrove	Burum	Private	Private	S-1		0.5 NW Richgrove	4
Total of Record, Tulare County								152
KINGS								
6-15	†Summit Lake	Auxiliary	War Surplus	U. S. WAA	2		10.0 WNW Lemoore	
6-16	†Murray	Auxiliary	War Surplus	U. S. WAA	3		14 SW Lemoore	
6-45	†*Hanford	Municipal	Public	City of Hanford	1	1641	1.2 SE Hanford	25
6-46	Lemoore	Municipal	Public	City of Lemoore	4	1767	9.1 SW Lemoore	
6-80	†*Avenal		Private	Private	S-2	1280	1 W Avenal	7
6-81	Corcoran		Commercial	Private	S-2	1439	1.3 WNW Corcoran	
6-82	Corcoran	Salzer Farms	Commercial	Private	2		2.0 SE Corcoran	15
6-83	Corcoran	Van Glahn	Commercial	Private	2		5 SSW Corcoran	
6-84	*Corcoran	Harvey	Commercial	Private	2	1441	2.7 NNW Corcoran	
6-85	*Lemoore	Kleinhammer	Private	Private	S-1	1768	1.0 N Lemoore	
6-86	Lemoore	Terra	Private	Private	S-2		4.8 SE Lemoore	
6-87	Kettleman City		Private	Private	S-1			
6-88	Stratford	Newton	Private	Private	1	2320	4.5 SSW Stratford	
Total of Record, Kings County								47
MADERA								
6-20	Bass Lake (Wishon)		Federal	U. S. F. S.	S-1	1301	1.5 WNW Bass Lake	2
6-45	*Madera	Municipal	Public	City of Madera	4	1853	3.5 WNW Madera	7
Total of Record, Madera County								9

* Included in 1947 National Airport Plan—16.
† Project pending in 1947 Program—6.

† Surplus military—Disposal pending—6.



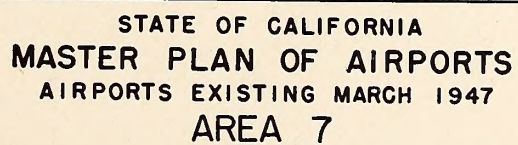
TABULATION OF EXISTING AIRPORTS
AREA 7—INYO-MONO AREA

Airports Shown on Plate M-7

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
	INYO							
7-1	*Death Valley.....	Furnace Creek.....	Public.....	U. S.-N. P. S.....	S-2	1596	1.0 WNW Furnace Creek Inn	
7-2	*Darwin.....	Panamint Valley.....	Public.....	U. S.-Pub. Dom.....	1	1485	12.5 NE Darwin	
7-3	*Darwin.....		Public.....	U. S.-Pub. Dom.....	S-1		S Darwin	
7-4	Bishop.....	Coyote Meadows.....	Public.....	U. S.-Pub. Dom.....	S-1		10 SW Bishop	
7-5	Trona.....	CAA Site No. 73.....	Public.....	U. S.-C. A. A.....	S-5	2363	5.0 NE Trona	
7-25	*Bishop.....		Public.....	Co. of Inyo.....	6	1327	2.0 ENE Bishop.....	20
7-26	†*Big Pine.....		Public.....	Co. of Inyo.....	2	1324	3.4 ESE Big Pine	
7-27	*Independence.....		Public.....	Co. of Inyo.....	S-2	1686	0.9 N Independence.....	2
7-28	Manzanar.....		Public.....	Co. of Inyo.....	3	1861	0.5 E Manzanar	
7-29	†*Lone Pine.....		Public.....	Co. of Inyo.....	1	1791	0.8 SE Lone Pine.....	4
7-50	Bishop.....	Symons.....	Commercial.....	Private.....	1	1328	4.0 W Bishop	
7-51	Olancho.....	Adamson.....	Commercial.....	Private.....	1	1985	0.6 SE Olancho	
7-52	Olancho.....	Grant Airpark.....	Commercial.....	Private.....	S-2		2.0 S Olancho.....	1
7-53	*Coso Junction.....	Gill.....	Private.....	Private.....	S-2	1454	0.2 W Coso Junction	
7-55	*Death Valley Jet.....	Amargosa.....	Private.....	Private.....	1	1494	0.7 W Death Valley Jet.	
7-56	*Deep Springs.....		Private.....	Private.....	S-1		NE Deep Springs	
							Total of Record, Inyo County	27
	MONO							
7-60	*Bridgeport.....		Public.....	Co. of Mono.....	S-2	1346	0.3 NNE Bridgeport.....	2
							Total of Record, Mono County	2

* Included in 1947 National Airport Plan—11.

† Project pending in 1947 Program—2.



TABULATION OF EXISTING AIRPORTS
AREA 8—STOCKTON METROPOLITAN AREA

Airports Shown on Plate M-8-10 (Page 121)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
SAN JOAQUIN								
8-25	*Stockton.....	Municipal.....	Public.....	City of Stockton.....	4	2314	4.6 SSE Stockton.....	42
8-26	*Lodi.....	Kingsbury.....	Public.....	City of Lodi.....	3	1783	5.5 WSW Lodi.....	
8-27	*Tracy.....	Municipal.....	Public.....	City of Tracy.....	3	2359	3.4 SSW Tracy.....	10
8-28	Tracy.....	New Jerusalem.....	Public.....	City of Tracy.....	3	2358	8.0 ESE Tracy.....	
8-50	Stockton.....	Oranges.....	Commercial.....	Private.....	1	2317	5.0 N Stockton.....	55
8-51	Stockton.....	West Lane.....	Commercial.....	Private.....	S-2	2315	4.1 N Stockton.....	15
8-52	Stockton.....	Sky Ranch.....	Private.....	Private.....	S-1		4.0 E Stockton.....	5
8-53	Stockton.....	Weber.....	Private.....	Private.....	S-1		3.0 NNW Stockton (Closed)	
8-54	Lodi.....	Linds.....	Commercial.....	Private.....	S-2	1782	4.8 N Lodi.....	15
8-55	Lodi.....	Airpark.....	Commercial.....	Private.....	S-2	1784	4.5 SW Lodi.....	8
8-56	Manteca.....	Summer Home.....	Private.....	Private.....	1	1858	1.5 NE Manteca.....	4
Total of Record, San Joaquin County								154
STANISLAUS								
8-5	Crows Landing.....	NAAS.....	Military.....	U. S. Navy.....	6	1469	2.5 NW Crows Landing	
8-30	†*Modesto.....	Municipal.....	Public.....	City of Modesto.....	3	1896	2.2 ESE Modesto.....	79
8-31	Vernalis.....	.....	Public.....	Co. of Stanislaus.....	6	2403	2.4 SSW Vernalis	
8-38	Turlock.....	Municipal (Ballico).....					(Airport in Merced County)	
8-60	Turlock.....	Airpark.....	Commercial.....	Private.....	S-1	2378	1.5 SSE Turlock.....	16
8-61	Turlock.....	Atwood.....	Commercial.....	Private.....	S-1	2377	4.0 WSW Turlock.....	14
8-62	Oakdale.....	.....	Commercial.....	Private.....	1		2.5 E Oakdale.....	13
8-63	Patterson.....	.....	Commercial.....	Private.....	1			14
Total of Record, Stanislaus County								136
MERCED								
8-10	Merced.....	Castle AAF.....	Military.....	U. S. Army.....	3	1888	7.0 NW Merced	
8-11	†Howard.....	Merced Auxiliary No. 3.....	War Surplus.....	U. S. WAA.....	2		17.6 W Merced	
8-12	†Athlone.....	Merced Auxiliary No. 4.....	War Surplus.....	U. S. WAA.....	2		10.2 SE Merced	
8-13	†Potter.....	Merced Auxiliary No. 5.....	War Surplus.....	U. S. WAA.....	2		12.0 SSW Merced	
8-35	†*Merced.....	Municipal (New).....	Public.....	City of Merced.....	3	1886	1.6 WSW Merced.....	30
8-36	Merced.....	Municipal (Old).....	Public.....	City of Merced.....	2		2.5 NW Merced.....	
8-37	†*Los Banos.....	Municipal.....	Public.....	City of Los Banos.....	S-2	1839	1.2 W Los Banos.....	18
8-38	Turlock.....	Municipal (Ballico).....	Public.....	City of Turlock.....	2		8.5 E Turlock.....	15
8-70	Gustine.....	.....	Private.....	Private.....	1	1636	2.2 E Gustine	
Total of Record, Merced County								63
CALAVERAS								
8-80	Valley Springs.....	Mother Lode.....	Commercial.....	Private.....	S-1	2394	6.6 NE Valley Springs.....	2
TUOLUMNE								
8-45	†*Sonora.....	(Columbia).....	Public.....	Co. of Tuolumne.....	1	2302	4.0 NNE Sonora.....	12
MARIPOSA								
8-48	*Mariposa.....	Mt. Bullion.....	Public.....	Co. of Mariposa.....	1	1866	4.5 NW Mariposa	

* Included in 1947 National Airport Plan—8.

† Project pending in 1947 Program—4.

‡ Surplus military—Disposal pending—3.

TABULATION OF EXISTING AIRPORTS
AREA 9—SAN FRANCISCO BAY AREA

Airports Shown on Plate M-9 (Page 119)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
9-25	SAN FRANCISCO San Francisco.....	Municipal.....					(Airport in San Mateo County)	
9-25	SAN MATEO *San Bruno.....	San Francisco Municipal.....	Public.....	City and County of San Francisco.....	7	2187	9.0 S. San Francisco.....	21
9-26	*Half Moon Bay.....		Public.....	Co. of San Mateo.....	4	1638	5.5 NW Half Moon Bay.....	
9-27	*Palo Alto.....	Municipal.....	Public.....	City of Palo Alto.....	1	2022	2.0 ENE Palo Alto.....	
9-50	Belmont.....		Commercial.....	Private.....	S-2	1313	0.5 N Belmont.....	105
9-51	San Carlos.....	Patton.....	Commercial.....	Private.....	1	2160	1.6 NNW Redwood City.....	
9-52	San Carlos.....	Cooley.....	Commercial.....	Private.....	1	2161	2.9 NNW Redwood City.....	17
9-53	San Mateo.....	Bay Meadows.....	Commercial.....	Private.....	S-2	2214	1.7 SE San Mateo.....	60
9-54	San Mateo.....		Commercial.....	Private.....	S-1	2215	2.2 ESE San Mateo.....	26
9-55	Redwood City.....		Private.....	Private.....	S-3	2097	1.2 E Redwood City.....	
							Total of Record, San Mateo County	229
9-1	SANTA CLARA Mountain View.....	Moffett NAS.....	Military.....	U. S. Navy.....	6	1925	2.0 NE Mountain View.....	
9-27	*Palo Alto.....	Municipal.....	Public.....	City of Palo Alto.....			(Airport in San Mateo County).....	118
9-29	†San Jose.....	Municipal.....	Public.....	City of San Jose.....	S-1	2204	2.0 NW San Jose.....	25
9-60	Gilroy.....		Commercial.....	Private.....	S-2		1.5 NW Gilroy.....	4
9-61	Los Gatos.....	Ames.....	Commercial.....	Private.....	S-1		4.5 SSE Los Gatos.....	
9-62	Morgan Hill.....	Valley Airport.....	Commercial.....	Private.....	S-1	1922	1.2 S Morgan Hill.....	
9-63	Mountain View.....		Commercial.....	Private.....	S-2	1926	2.2 NW Mountain View.....	18
9-64	San Jose.....	Pacific Airmotive.....	Commercial.....	Private.....	S-2	2202	2.6 E San Jose.....	40
9-65	San Jose.....	Reid-Hillview.....	Commercial.....	Private.....	S-2	2203	4.0 E San Jose.....	64
9-66	Warm Springs.....		Commercial.....	Private.....	S-2	2418	2.0 N Milpitas.....	12
							Total of Record, Santa Clara County	281
9-3	ALAMEDA Alameda NAS.....		Military.....	U. S. Navy.....	4	1226	4.5 WNW Alameda.....	
9-4	Livermore.....	NAS.....	Military.....	U. S. Navy.....	3	1779	3.7 E Livermore.....	
9-5	Livermore.....	NOLF.....	Military.....	U. S. Navy.....	2	1780	2.0 WNW Livermore.....	
9-32	*Oakland.....	Municipal.....	Public.....	Port of Oakland.....	5	1971	5.0 S Oakland.....	120
9-33	*Hayward.....	Municipal (AA Field).....	Public.....	City of Hayward.....	5	1653	2.0 WSW Hayward.....	129
9-70	Centerville.....	Center Field.....	Commercial.....	Private.....	S-2		2.5 SSE Centerville.....	19
9-71	Livermore.....		Commercial.....	Private.....	1		1.0 SW Livermore.....	10
9-66	Warm Springs.....						(Airport in Santa Clara County)	
							Total of Record, Alameda County	278
9-8	CONTRA COSTA Concord.....	NOLF.....	Military.....	U. S. Navy.....	3	1438	1.9 NE Concord (Closed).....	
9-36	*Concord.....	Buchanan Field.....	Public.....	Co. of Contra Costa.....	4	1437	1.5 WNW Concord.....	131
9-37	Martinez.....	Airpark.....	Public.....	City of Martinez.....	1	1868	0.5 N Martinez.....	14
9-74	Antioch.....	Airvale.....	Commercial.....	Private.....	S-1		1.0 E Antioch.....	
9-75	Antioch.....		Commercial.....	Private.....	S-1		1.0 S Antioch.....	6
9-76	San Ramon.....		Commercial.....	Private.....	S-2	2225.4	2.5 SE San Ramon.....	4
9-77	Walnut Creek.....	Sherman.....	Commercial.....	Private.....	S-2	2416	3.5 N Walnut Creek.....	21
							Total of Record, Contra Costa County	176

Concluded on Page 118.

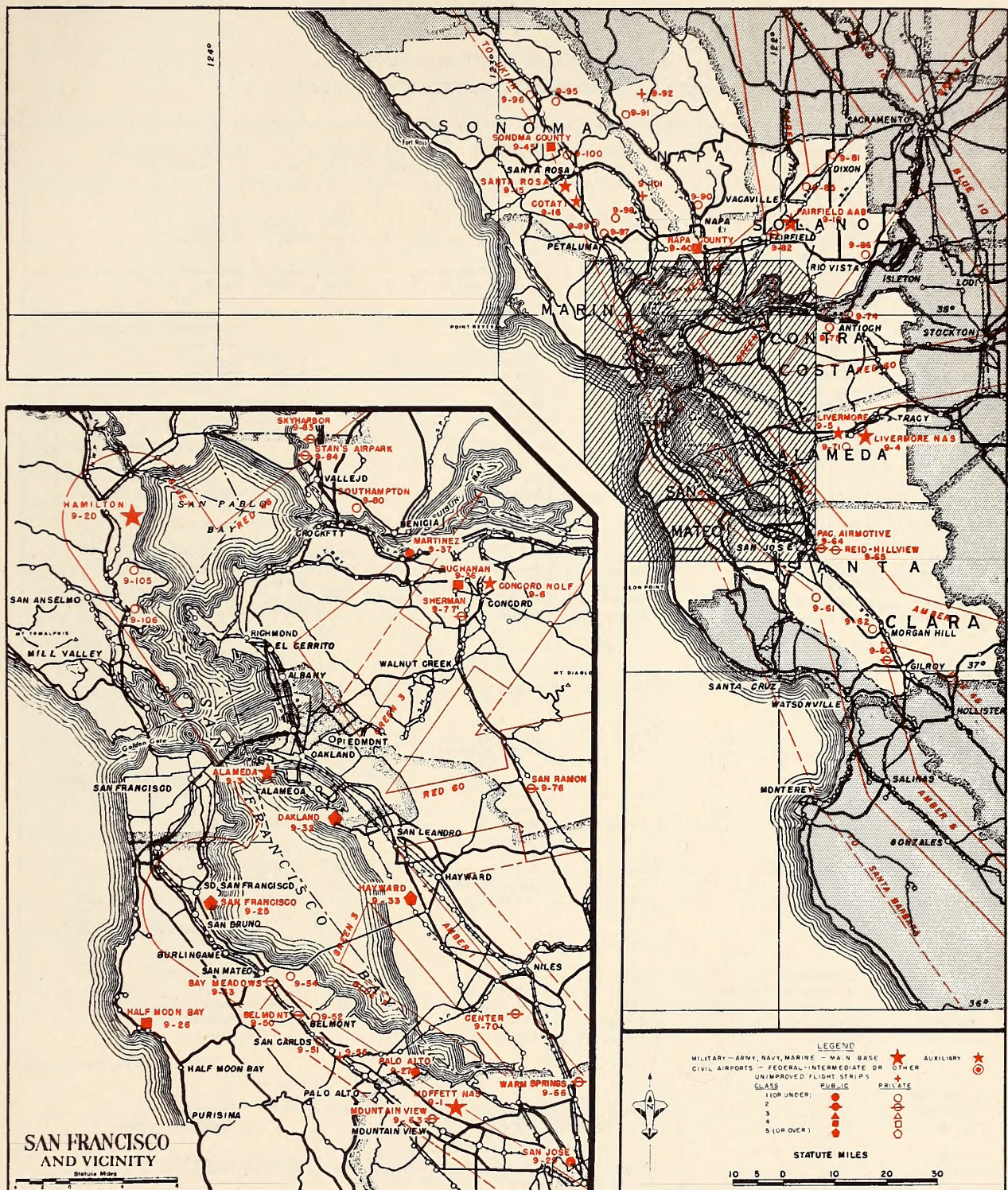
TABULATION OF EXISTING AIRPORTS
AREA 9—SAN FRANCISCO BAY AREA—Continued

Airports Shown on Plate M-9

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
9-10	SOLANO Fairfield	Fairfield-Suisun-AAB	Military	U. S. Army	6		5.5 NE Fairfield	
9-80	Benicia	South Hampton Bay	Commercial	Private	1		2.5 WNW Benicia	
9-81	Dixon		Commercial	Private	1		2.4 NNE Dixon	4
9-82	Fairfield	Airpark	Commercial	Private	S-2	1565	1.0 E Fairfield	25
9-83	Vallejo	Skyharbor	Commercial	Private	S-2	2391	3.5 NNW Vallejo	25
9-84	Vallejo	Stan's Airpark	Commercial	Private	1	2392	2.5 NNW Vallejo	10
9-85	Vacaville	Vaca-Dixon	Commercial	Private	1		4.0 NE Vacaville	5
9-86	Rio Vista		Commercial	Private	1		Rio Vista	3
Total of Record, Solano County								72
9-40	NAPA *Napa County		Public	Co. of Napa	4	1933	5.5 S Napa	47
9-90	Napa	Sky Ranch	Commercial	Private	1	1934	2.2 NNW Napa	
9-91	Calistoga		Commercial	Private	1		0.2 E Calistoga	3
9-92	Aetna Springs		Private	Private	S-1		Aetna Springs	
Total of Record, Napa County								50
9-15	SONOMA Santa Rosa	NAAS	Military	U. S. Navy	6	2258	2.5 SW Santa Rosa	
9-16	Cotati	NOLF	Military	U. S. Navy	3	1456	1.5 NW Cotati	
9-45	*Santa Rosa	Sonoma County	Public	Co. of Sonoma	4	2260	7.0 NW Santa Rosa	50
9-95	Healdsburg	Alexander Valley	Commercial	Private	1	1651.5	3.7 ENE Healdsburg	5
9-96	Healdsburg	Norton Sky Ranch	Commercial	Private	1	1651.7	5.2 NNW Healdsburg	4
9-97	Petaluma	Justman	Commercial	Private	S-1	2038	1.5 ENE Petaluma	3
9-98	Petaluma	Oakview	Commercial	Private	1	2039	3.3 ENE Petaluma	6
9-99	Petaluma		Commercial	Private	S-1	2040	1.7 N Petaluma	16
9-100	Santa Rosa	Airpark	Commercial	Private	1	2260.1	2.8 NNW Santa Rosa	
9-101	Sonoma	Valley of Moon	Commercial	Private	1		N Sonoma	
Total of Record, Sonoma County								84
9-20	MARIN San Rafael	Hamilton AAB	Military	U. S. Army	6		6.5 NNE San Rafael	
	†*Greenbrae	Marin County (Proposed)	Public	Co. of Marin				
9-105	San Rafael	Marin County Inc.	Commercial	Private	S-1	2224	2.9 NNE San Rafael	32
9-106	San Rafael	San Francisco Bay Airport	Commercial	Private	S-1		1.0 SE San Rafael	3
Total of Record, Marin County								35

* Included in 1947 National Airport Plan—10.

† Project pending in 1947 Program—2.



STATE OF CALIFORNIA
MASTER PLAN OF AIRPORTS
AIRPORTS EXISTING MARCH 1947
AREA 9

TABULATION OF EXISTING AIRPORTS
AREA 10—SACRAMENTO METROPOLITAN AREA

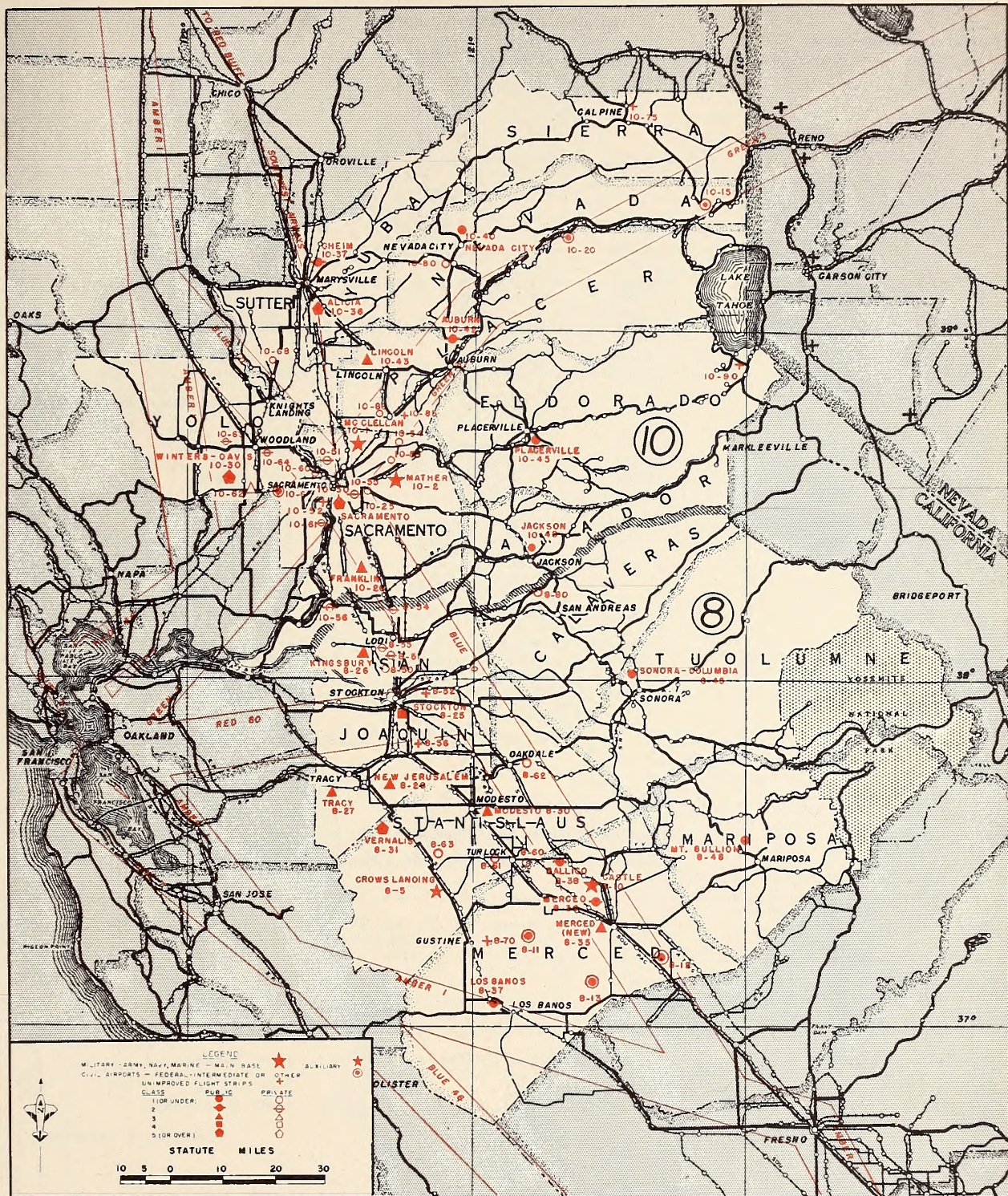
Airports Shown on Plate M-8-10

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from		Aircraft 10/1/46
	SACRAMENTO								
10-1	Sacramento	McClellan AAB	Military	U. S. Army	6	2128	7.5 NE	Sacramento	
10-2	Sacramento	Mather AA Field	Military	U. S. Army	7	2126	10.5 E	Sacramento	
10-25	*Sacramento	Municipal	Public	City of Sacramento	5	2127	4.2 S	Sacramento	60
10-26	Franklin		Public	Co. of Sacramento	3	1571	5.5 SSE	Franklin	
10-50	Sacramento	Sky Ranch	Commercial	Private	S-2	2129	4.0 SSE	Sacramento	24
(10-60)	Sacramento	Capitol Sky Park						(Airport in Yolo County)	
10-51	Sacramento	Branstetter	Commercial	Private	S-2		3.0 NNW	Sacramento	8
10-52	Sacramento	Jensen	Private	Private	1		4.5 SSW	Sacramento	18
10-53	Fair Oaks	Sky Nook	Commercial	Private	1		2.3 S	Fair Oaks	7
10-54	Fair Oaks	Phoenix	Commercial	Private	1		3.5 E	Fair Oaks	8
10-55	Perkins	Sky Line	Commercial	Private	1		6.0 ESE	Sacramento	13
10-56	Walnut Grove		Commercial	Private	S-2		4.0 SE	Walnut Grove	5
							Total of Record, Sacramento County		143
	YOLO								
10-6	*Davis	State Forestry	Public	State of California	S-2	1488	3.0 E	Davis	1
10-30	*Winters	Davis Flight Strip	Public	Co. of Yolo	5	1489	6.2 WNW	Davis	3
10-60	Sacramento	Capitol Sky Park	Commercial	Private	1	2130	2.0 W	Sacramento	15
10-61	Clarksburg	Borgas	Commercial	Private	S-2	1405	2.4 NNE	Clarksburg	15
10-62	Davis	University	Commercial	Private	S-3	1488.1	2.4 WSW	Davis	31
10-63	Woodland	Yolo Flyers Club	Commercial	Private	2	2467	5.5 W	Woodland	12
10-64	Woodland	Air Park	Commercial	Private	S-2		2.0 SE	Woodland	3
							Total of Record, Yolo County		80
	SUTTER								
10-68	Robbins	Sutter Basin	Commercial	Private	1		4 N	Knights Landing	
	YUBA								
10-36	*Marysville	Alicia	Public	Co. of Yuba	5	1873	3.2 SSE	Marysville	20
10-37	*Marysville	Cheim	Public	City of Marysville	2	1872	1.5 NE	Marysville	25
							Total of Record, Yuba County		45
	SIERRA								
10-75	Calpine		Private	Private	1	1367	1.0 SE	Calpine	
	NEVADA								
10-15	Truckee	(CAA Site 16-B)	Public	U. S.-CAA	1	2365	3.6 ENE	Truckee	
10-40	*Nevada City	Municipal	Public	City of Nevada City	1	1941	1.5 NW	Nevada City	12
10-80	Grass Valley	Gilmore	Commercial	Private	S-1	1625	0.8 W	Grass Valley	7
							Total of Record, Nevada County		19
	PLACER								
10-20	Blue Canyon	(CAA Site 13)	Public	U. S.-CAA	1	1333	1.1 NNE	Blue Canyon	
10-42	*Auburn	Municipal (CAA Site 10)	Public	City of Auburn	S-2	1273	3.3 N	Auburn	15
10-43	Lincoln		Public	City of Lincoln	3	1772	3.3 WNW	Lincoln	5
10-85	Roseville	Pruitt	Private	Private	1		S	Roseville	1
10-86	Roseville	Dunbar	Commercial	Private	1		2 WSW	Roseville	10
							Total of Record, Placer County		31
	EL DORADO								
10-45	*Placerville		Public	City of Placerville	S-1	2052	1.5 SE	Placerville	1
10-90	*Meyers		Commercial	Private				(Under construction)	
	AMADOR								
10-48	*†Jackson		Public	Co. of Amador	S-1	1701	2.0 NNW	Jackson	2

* Included in 1947 National Airport Plan—10.

† Project pending in 1947 Program—1.

‡ Surplus military—Disposal pending—0.



STATE OF CALIFORNIA
 MASTER PLAN OF AIRPORTS
 AIRPORTS EXISTING MARCH 1947
 AREAS 8 & 10

CALIFORNIA AIRPORTS

TABULATION OF EXISTING AIRPORTS
AREA 11—REDWOOD EMPIRE

Airports Shown on Plate M-11

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/47
11-1	DEL NORTE							
11-25	*Gasquet		Public	U.S.F.S. (Lease)	S-2	1465	13.0 ENE Crescent City	
	*Crescent City		Public	Co. of Del Norte	4	1464	2.5 NW Crescent City	7
							Total of Record, Del Norte County	7
11-5	HUMBOLDT							
	Eureka	Arcata NAAS	Military	U. S. Navy Lease	5	1559	7.3 NNW Arcata (Leased from County)	
11-30	*Eureka		Public	Co. of Humboldt	1	1560	3.6 ENE Eureka	25
11-31	Eureka	(NOLF-LTA)	Public	City of Eureka	1	1561	2.0 W Eureka	
11-32	*Fortuna	Rohnerville	Public	Co. of Humboldt	1		2.9 SSE Fortuna	10
11-33	*Garberville		Public	Co. of Humboldt	S-1		1.0 SW Garberville	1
11-60	Orleans		Private	Private	S-1	1996	0.5 W Orleans	
11-61	Scotia		Commercial	Private	S-2		1.5 SSE Scotia	7
							Total of Record, Humboldt County	43
11-40	MENDOCINO							
	*Mendocino	Little River	Public	Co. of Mendocino	4	1778	2.5 SE Little River	6
11-41	*Ukiah	Municipal	Public	City of Ukiah	3	2383	1.0 S Ukiah	9
11-42	*Covelo	Round Valley	Public	Co. of Mendocino	S-2	1458	0.7 SW Covelo	
11-43	*Willits	Municipal	Public	City of Willits	1	2455	1.3 ENE Willits	6
11-70	Ft. Bragg	White	Commercial	Private	S-1		1.0 NE Ft. Bragg	4
11-71	Laytonville	101 Ranch	Commercial	Private	S-1	1761	1.0 S Laytonville	4
							Total of Record, Mendocino County	29
11-15	LAKE							
	*Gravelly Valley		Public	U.S.F.S.	S-4	2387	20.0 N Upper Lake	
11-80	Lakeport	Lamson	Commercial	Private	S-2	1743	3.5 SSE Lakeport	4
11-81	Lower Lake	Seigler	Commercial	Private	S-2	1849	4.0 WSW Lower Lake	
11-82	Upper Lake		Private	Private	S-1		1.0 SE Upper Lake	
11-83	Lower Lake	Austins	Private	Private	S-1		3.0 NNW Lower Lake	
							Total of Record, Lake County	4

* Included in 1947 National Airport Plan—10.

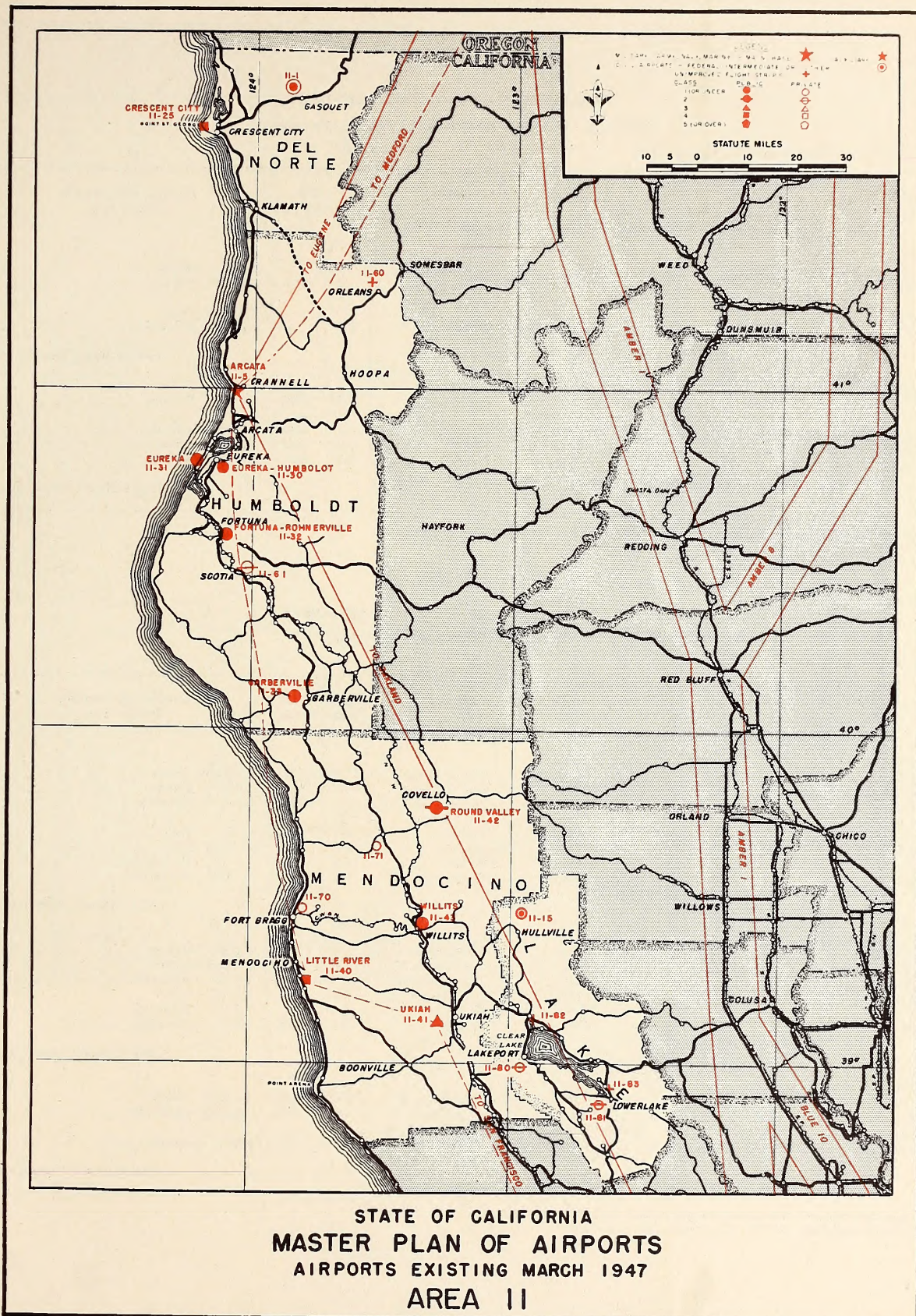
† Project pending in 1947 Program—0.

TABULATION OF EXISTING AIRPORTS
AREA 12—CHICO-RED BLUFF AREA

Airports Shown on Plate M-12-14 (Page 127)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
12-1	TEHAMA							
12-2	†Campbell	(Chico Auxiliary)	War Surplus	U. S. WAA	2		13 NNW Chico	
12-3	†Vina	(Chico Auxiliary)	War Surplus	U. S. WAA	2		2 E Vina	
	†Kirkwood	(Chico Auxiliary)	War Surplus	U. S. WAA	2		2 E Kirkwood	
12-25	*Red Bluff	Bidwell	Public	City of Red Bluff	3	2085	1.7 SSW Red Bluff	13
12-50	Corning	Woodson	Commercial	Private	S-2	1443	1.3 NE Corning	10
12-51	Mineral		Private	Private	S-1	1893	1.4 WSW Mineral (Closed)	
							Total of Record, Tehama County	23
12-30	BUTTE							
12-31	Chico	Municipal (AAFld)	Public	City of Chico	6	1395	5.0 N Chico	20
	*Oroville	Municipal (AAFld)	Public	City of Oroville	5	1998	3.5 WSW Oroville	10
12-60	Chico	Ranch Aero	Commercial	Private	1	1396.1	2.2 WSW Chico	12
12-61	Chico	Patrick	Commercial	Private	S-2	1396	2.0 SSE Chico	12
12-62	Gridley		Commercial	Private	S-2	1632	0.7 ENE Gridley	7
12-63	Honcut		Private	Private	1		0.5 N Honcut	3
							Total of Record, Butte County	64

Concluded on Page 124.



TABULATION OF EXISTING AIRPORTS
AREA 12—CHICO-RED BLUFF AREA—Continued

Airports Shown on Plate M-12-14 (Page 127)

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
12-35	GLENN							
12-36	Orland.....	Chico Auxiliary.....	Public.....	Co. of Glenn.....	2		2 SE Orland.....	7
12-36	*Willows.....	Glenn Co.....	Public.....	Co. of Glenn.....	4	2461	1.3 WSW Willows.....	25
12-70	Artois.....						2.3 S Artois	
12-71	Elk Creek.....		Private.....	Private.....	S-1		0.5 S Elk Creek.....	1
Total of Record, Glenn County								33
12-16	COLUSA							
12-16	Williams.....	(CAA Site 9).....	Public.....	US-CAA.....	S-3	2452	4.0 SSW Williams.....	3
12-80	Arbuckle.....	Vawters.....	Private.....	Private.....	S-1	1249	2.6 SSE Arbuckle.....	3
12-81	Colusa.....	Falcon.....	Commercial.....	Private.....	S-2	1431	1.2 SW Colusa.....	12
12-82	Williams.....	Dalton.....	Commercial.....	Private.....	S-2	2451	1.0 ENE Williams.....	10
Total of Record, Colusa County								28

* Included in 1947 National Airport Plan—3.

† Project pending in 1947 Program—0.

‡ Surplus military—Disposal pending—3.

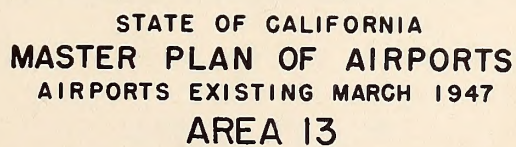
TABULATION OF EXISTING AIRPORTS
AREA 13—MODOC PLATEAU

Airports Shown on Plate M-13

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
13-25	MODOC							
13-25	Alturas No. 2.....		Public.....	City of Alturas.....	4	1235	6.8 WNW Alturas	
13-26	Alturas No. 1.....		Public.....	City of Alturas.....	S-2	1234	1.0 W Alturas.....	13
13-27	*Cedarville.....		Public.....	34 Agric. Dist.....	S-1	1383	0.6 S Cedarville.....	1
13-28	*Adin.....	(Proposed).....	Public.....	Co. of Modoc.....	(1)			
13-50	Canby.....		Private.....	Private.....	S-1		S Canby.....	2
13-51	Likely.....		Private.....	Private.....	S-1		WSW Likely.....	
13-52	Ft. Bidwell.....		Private.....	Private.....	S-1		NE Ft. Bidwell.....	1
13-53	Stronghold.....		Private.....	Private.....	S-1		ESE Stronghold.....	1
Total of Record, Modoc County								18
13-6	LASSEN							
13-6	Amedee.....	Honey Lake Flight Strip.....	Public.....	U.S.B.P.Rds.....	5	1239	4.0 SE Amedee.....	
13-7	Karlo.....	Secret Valley Int.....	Public.....	U.S.CAA No. 52.....	S-3	1708	3.6 ESE Karlo.....	
13-30	*Susanville.....		Public.....	City of Susanville.....	S-2	2332	6.5 SE Susanville.....	6
13-31	*Bieber.....		Public.....	Co. of Lassen.....	S-2		1.0 NE Bieber.....	
13-32	*Westwood.....		Public.....	Co. of Lassen.....	S-1		1.5 W Westwood.....	
13-60	*Ravendale.....		Private.....	Private.....	S-1	2082	0.2 N Ravendale.....	
Total of Record, Lassen County								Unknown
13-11	PLUMAS							
13-35	*Chester.....		Public.....	U.S.F.S.....	S-2	1392	1.5 SSW Chester.....	
13-36	*Beckworth.....		Public.....	Co. of Plumas.....	S-2	1307	0.8 ENE Beckworth.....	4
13-36	†Quincy.....	(Proposed).....	Public.....	Co. of Plumas.....	(2)			
13-70	Quincy.....	Sky Harbor.....	Commercial.....	Private.....	1	2073	2.5 E Quincy.....	10
Total of Record, Plumas County								14

* Included in 1947 National Airport Plan—9.

† Project pending in 1947 Program—3.



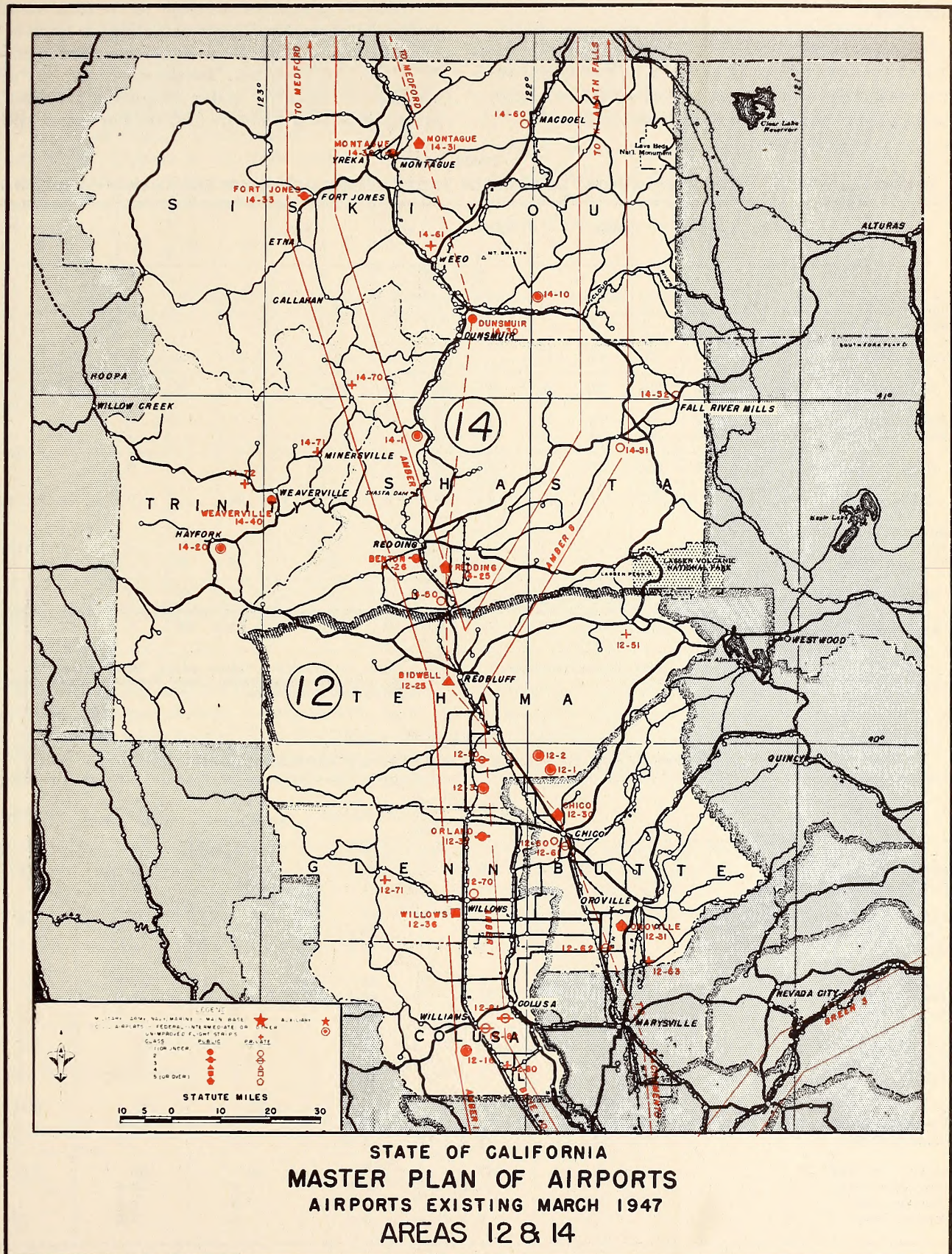
TABULATION OF EXISTING AIRPORTS
AREA 14—SHASTA-CASCADE AREA

Airports Shown on Plate M-12-14

Map Code	COUNTY City	Airport Name	Category	Ownership	CAA Class	CAA Site No.	Location, Direction and Distance from	Aircraft 10/1/46
SHASTA								
14-1	Delta	(CAA Site 22)	Public	U.S.-CAA	S-1	1503	1.0 SW Delta	
14-25	*Redding		Public	City of Redding	5	2089	7.7 SE Redding	4
14-26	*Redding	Benton Air Park	Public	City of Redding	2	2088	1.1 WSW Redding	12
14-50	Anderson	Pinnegar	Commercial	Private	1	1243	1.0 S Anderson	2
14-51	Burney		Commercial	Private	1		1.0 SE Burney	
14-52	Fall River Mills		Commercial	Private	1	1569	1.0 N Fall River Mills	
Total of Record, Shasta County								18
SISKIYOU								
14-10	McCloud	Ash Creek	Public	U.S.F.S.	S-2	1879	11.2 ENE McCloud	
14-30	†Dunsmuir		Public	Co. of Siskiyou	1	1521	4.5 N Dunsmuir	6
14-31	*Montague	(New)	Public	Co. of Siskiyou	6	1906	4.3 NE Montague	3
14-32	Montague	(Old)	Public	City of Montague	S-2	1905	1.0 W Montague	10
14-33	*Ft. Jones		Public	Co. of Siskiyou	S-2	1582	1.5 NW Ft. Jones	1
14-60	Macdoel		Commercial	Private	S-1		0.5 SW Macdoel	
14-61	*Weed	Jackson Ranch	Private	Private	1		3.7 NW Weed	
Total of Record, Siskiyou County								20
TRINITY								
14-20	*Hayfork		Public	U.S.F.S.	1	1650	1.2 E Hayfork	
14-40	*Weaverville		Public	Co. of Trinity	1	2431	1.0 SSW Weaverville	3
14-70	Carrville		Private	Private	S-1			
14-71	Minersville		Private	Private	S-1			
14-72	Junction City		Private	Private	S-1			
Total of Record, Trinity County								3

* Included in 1947 National Airport Plan—8.

† Project pending in 1947 Program—1.



Analysis

In Tables 46 through 55 the foregoing lists of existing airports are treated objectively to indicate the number of each class in each category for the State at large, and for its several Aviation Areas and Counties.

Table 46 presents a summary of the data contained in the fourteen Area Lists and shows a total of 202 Public Airports, 140 of which are owned or sponsored by Cities and Counties. Twenty-seven percent of the total are of Class 1 or under, 28 percent are Class 2 or Sub-2, while 33 percent are of Class 4 or larger, suitable

TABLE 46

CALIFORNIA'S TOTAL AIRPORT INVENTORY SUMMARY OF AREA LISTS BY CATEGORIES AND CLASSES—APRIL, 1947

	Sub. 1	1	Sub. 2	2	Sub. 3	3	Sub. 4	4	Sub. 5	5	6	7	8	9	Total
Civil Airports															
War Surplus*	1	3		20		1		6		3					34
State and Federal	7	3	7				1								18
C. A. A. Intermediate	1	2			6				1						10
City and County	11	27	15	15		15	1	28		17	9	1	1		140
Subtotal—Public	20	35	22	35	6	16	2	34	1	20	9	1	1		202
Commercial	32	88	59	22	1	2	1			2					207
Private	45	26	13	2	1	1						1			89
Subtotal—Private	77	114	72	24	2	3	1			2		1			296
Subtotal—Civil	97	149	94	59	8	19	3	34	1	22		2	1		498
Military Airports															
Army				1		2					7	1		1	12
Navy and Marine		8		4		4		5	1	6	7				35
Subtotal—Military		8		5		6		5	1	6	14	1		1	47
Grand Total—All Airports	97	157	94	64	8	25	3	39	2	28	14	3	1	1	545

* Includes all surplus military fields with disposal pending by War Assets Administration at date of this report.

Note: In following tables where "Sub" classes have been omitted, airports shown under "Sub" headings above have been included in next lower class.

TABLE 47

DEVELOPMENT OF CALIFORNIA AIRPORTS BY CATEGORIES, 1929-1947

	City and County	Commercial	CAA Intermediate	Army-Navy and All Others	Total
October 20, 1929	56	49	26	30	161
Percent of Total	34.8	30.4	16.1	18.7	
December 31, 1935	78	74	20	20	192
Percent of Total	40.6	38.6	10.4	10.4	
Ratio to 1929	1.4	1.5	.8	.7	1.2
December 31, 1940	65	74	17	18	174
Percent of Total	37.4	42.5	9.8	10.3	
Ratio to 1935	.8	1.0	.9	.9	.9
July 1, 1945	61	76	12	133	282
Percent of Total	21.6	27.0	4.3	47.1	
Ratio to 1940	.9	1.0	.7	7.4	1.6
July 1, 1946	69	125	12	122	328
Percent of Total	21.0	38.1	3.7	37.2	
Ratio to 1945	1.1	1.6	1.0	.9	1.2
March 31, 1947	140	207	10	188	545
Percent of Total	25.7	38.0	1.8	34.5	
Ratio to 1946	2.0	1.7	.8	1.5	1.7
Ratio to 1929	2.5	4.2	.4	6.3	3.4

Source: 1929-1946—CAA Bulletins and Statistical Handbook.
1947—Tabulation of existing facilities from field study.

for air carrier or heavy cargo operation. Commercial airports, totaling 207, are predominantly of the lower classes (under Class 2), with only 2 percent suitable for air carrier operations. Half of all private airports listed are below Class 1 specifications, while 95 percent of this category are below Class 2. Of the total of 409 Public and Commercial Airports in the State only 68, or 17 percent are suitable for major air carrier operations, while another 21 afford minimum facilities for Feeder Line use.

Table 47 presents the record of development of airports in California by categories, and shows that public airports provided by Cities and Counties have increased only two and one-half times since 1929, while commercial airports have become 4.2 times as numerous.

Table 48 showing the combined growth by classes since 1938 indicates that the numerical increase in both public and commercial airports has been largely confined to Class 2 and under.

TABLE 48
DEVELOPMENT OF CALIFORNIA AIRPORTS BY CLASSES, 1938-1947

	S-1	1	2	3	4 and Over	Total
December 31, 1938.....	2	144	17	5	None	*168
Percent of Total.....	1.2	85.7	10.1	3.0		
July 1, 1945.....	28	65	64	28	97	
Percent of Total.....	9.9	23.1	22.7	9.9	34.4	282
July 1, 1946.....	30	87	84	30	97	328
Percent of Total.....	9.1	26.5	25.6	9.2	29.6	
March 31, 1947.....	97	251	72	28	†97	545
Percent of Total.....	17.8	46.1	13.2	5.1	17.8	
Ratio to 1938.....	48.5	1.7	4.2	5.6		3.2

* Excludes 6 military airports in 1938 only.

† Includes 41 Class 4, 28 Class 5, 23 Class 6, 3 Class 7, 1 Class 8, 1 Class 9 in 1947.

Source: 1938-45-46 from CAA Bulletins and Statistical Handbook.
1947—Tabulation of existing facilities from field study.

While the foregoing analysis presents a rather dismal picture for the State at large, it assumes even more serious proportions when viewed from the standpoint of distribution of existing facilities. Table 49 indicates the number of airports in each category in the several

counties and aviation areas, and shows that nine counties lack any public airports, sixteen lack any commercial airports and three counties lack both public and commercial airports.

TABLE 49
CALIFORNIA'S TOTAL AIRPORTS BY CATEGORIES—RECAPITULATION BY AREAS AND COUNTIES—APRIL, 1947

Area Number and County	City and County	Commercial	Federal and State ^a	Private ^b	Army-Navy ^c	Total
California.....	140	207	62	89	47	545
Area 1. San Diego.....	7	14	3	16	8	48
Area 2. Los Angeles Metropolitan.....	14	56	4	3	11	88
Los Angeles.....	9	31	1	3	3	47
Orange.....	3	8			6	17
West Riverside.....		10	2		1	13
S.W. San Bernardino.....	2	7	1		1	11
Area 3. Desert.....	12	16	10	4	5	47
Imperial.....	5	3			4	12
Riverside.....	4	7	4	1		16
San Bernardino.....	3	6	6	3	1	19
Area 4. Kern.....	15	4	9	11	6	45

CALIFORNIA AIRPORTS

TABLE 49—Continued

CALIFORNIA'S TOTAL AIRPORTS BY CATEGORIES—RECAPITULATION BY AREAS AND COUNTIES—APRIL, 1947

Area Number and County	City and County	Commercial	Federal and State ^a	Private ^b	Army-Navy ^c	Total
Area 5.....	13	17	3	13	3	49
Monterey.....	3	2	1	1		7
San Benito.....	1					1
San Luis Obispo.....	3	2	1	5		11
Santa Barbara.....	3	3	1	3	1	11
Santa Cruz.....	1	3				4
Ventura.....	2	7		4	2	15
Area 6.....	13	20	11	14		58
Fresno.....	4	9	4	5		22
Kings.....	2	4	2	5		13
Madera.....	1		1			2
Tulare.....	6	7	4	4		21
Area 7.....	5	3	5	4		17
Alpine.....						
Inyo.....	5	3	5	3		16
Mono.....				1		1
Area 8.....	12	10	3	3	2	30
Calaveras.....		1				1
Mariposa.....	1					1
Merced.....	4		3	1	1	9
San Joaquin.....	4	5		2		11
Stanislaus.....	2	4			1	7
Tuolumne.....	1					1
Area 9. San Francisco Metropolitan.....	10	36		2	9	57
Alameda.....	2	2			3	7
Contra Costa.....	2	4			1	7
Marin.....		2			1	3
Napa.....	1	2		1		4
San Francisco.....	1					1
San Mateo.....	1	5		1		7
Santa Clara.....	2	7			1	10
Solano.....		7			1	8
Sonoma.....	1	7			2	10
Area 10.....	10	14	3	3	2	32
Amador.....	1					1
El Dorado.....	1					1
Nevada.....	1	1	1			3
Placer.....	2	1	1	1		5
Sacramento.....	2	6		1	2	11
Sierra.....				1		1
Sutter.....		1				1
Yolo.....	1	5	1			7
Yuba.....	2					2
Area 11.....	9	5	2	3	1	20
Del Norte.....	1		1			2
Humboldt.....	4	1		1	1	7
Lake.....		2	1	2		5
Mendocino.....	4	2				6

TABLE 49—Continued
CALIFORNIA'S TOTAL AIRPORTS BY CATEGORIES RECAPITULATION BY AREAS AND COUNTIES—APRIL, 1947

Area Number and County	City and County	Commercial	Federal and State ^a	Private ^b	Army-Navy ^c	Total
Area 12.....	5	7	4	4	-----	20
Butte.....	2	3	-----	1	-----	6
Colusa.....	-----	2	1	1	-----	4
Glenn.....	2	1	-----	1	-----	4
Tehama.....	1	1	3	1	-----	6
Area 13.....	8	1	2	5	-----	16
Lassen.....	4	-----	1	1	-----	6
Modoc.....	3	-----	-----	4	-----	7
Plumas.....	1	1	1	-----	-----	3
Area 14.....	7	4	3	4	-----	18
Shasta.....	2	3	1	-----	-----	6
Siskiyou.....	4	1	1	1	-----	7
Trinity.....	1	-----	1	3	-----	5

^a Includes Civil Aeronautics Administration Intermediate, Forest Service and surplus military fields with disposal pending.

^b Includes airports limited to private use having no commercial activities.

^c Includes active Army, Navy and Marine Corps airports.

Table 50 affords evidence as to the proprietorship or sponsorship of such public airports as do exist throughout the State, and indicates that of the total of 202 owned by governmental agencies, 83 are provided by Counties, 56 by municipalities, and 63 by divisions of

State (2), or Federal Government. Seven counties of California have no public airports of any description, and of this same seven, three counties have neither public nor commercial airports. Nine counties have neither city nor county airports within their borders,

TABLE 50
CALIFORNIA CIVIL AIRPORTS OF PUBLIC OWNERSHIP BY PROPRIETARY DIVISION
OF GOVERNMENT—FOR AREAS AND COUNTIES—APRIL, 1947

Area Number County	County	City	C.A.A. Int. (^a)	U.S.F.S. State (^b)	U. S. W.A.A. (^c)	Total
California.....	83	56	11	18	34	202
Area 1. San Diego.....	4	3	-----	-----	3	10
Area 2. Los Angeles Metropolitan.....	6	8	1	-----	3	18
Los Angeles.....	4	5	1	-----	-----	10
Orange.....	1	2	-----	-----	-----	3
West Riverside.....	-----	-----	-----	-----	2	2
S.W. San Bernardino.....	1	1	-----	-----	1	3
Area 3. Desert.....	5	7	4	-----	6	22
Imperial.....	2	3	-----	-----	-----	5
Riverside.....	1	3	1	-----	3	8
San Bernardino.....	2	1	3	-----	3	9
Area 4. Kern.....	15	-----	-----	-----	9	24
Area 5.	7	6	-----	2	1	16
Monterey.....	1	2	-----	-----	1	4
San Benito.....	-----	1	-----	-----	-----	1
San Luis Obispo.....	2	1	-----	1	-----	4
Santa Barbara.....	2	1	-----	1	-----	4
Santa Cruz.....	-----	1	-----	-----	-----	1
Ventura.....	2	-----	-----	-----	-----	2
Area 6.....	10	3	-----	5	6	24
Fresno.....	4	-----	-----	-----	4	8
Kings.....	2	-----	-----	-----	2	4
Madera.....	-----	1	-----	1	-----	2
Tulare.....	4	2	-----	4	-----	10

CALIFORNIA AIRPORTS

TABLE 50—Continued

CALIFORNIA CIVIL AIRPORTS OF PUBLIC OWNERSHIP BY PROPRIETARY DIVISION
OF GOVERNMENT—FOR AREAS AND COUNTIES—APRIL, 1947

Area Number County	County	City	C.A.A. Int. (^a)	U.S.F.S. State (^b)	U. S. W.A.A. (^c)	Total
Area 7.....	5		1	4		10
Alpine.....						
Inyo.....	5		1	4		10
Mono.....						
Area 8.....	7	5			3	15
Calaveras.....						
Mariposa.....	1					1
Merced.....		4			3	7
San Joaquin.....	4					4
Stanislaus.....	1	1				2
Tuolumne.....	1					1
Area 9. San Francisco Metropolitan.....	5	5				10
Alameda.....		2				2
Contra Costa.....	1	1				2
Marin.....						
Napa.....	1					1
San Francisco.....	1					1
San Mateo.....	1					1
Santa Clara.....		2				2
Solano.....						
Sonoma.....	1					1
Area 10.....	4	6	2	1		13
Amador.....	1					1
El Dorado.....		1				1
Nevada.....		1	1			2
Placer.....		2	1			3
Sacramento.....	1	1				2
Sierra.....						
Sutter.....						
Yolo.....	1			1		2
Yuba.....	1	1				2
Area 11.....	5	4		2		11
Del Norte.....	1			1		2
Humboldt.....	3	1				4
Lake.....				1		1
Mendocino.....	1	3				4
Area 12.....	2	3	1		3	9
Butte.....		2				2
Colusa.....			1			1
Glenn.....	2					2
Tehama.....		1			3	4
Area 13.....	4	3	1	2		10
Lassen.....	2	1	1	1		5
Modoc.....	1	2				3
Plumas.....	1			1		2
Area 14.....	4	3	1	2		10
Shasta.....		2	1			3
Siskiyou.....	3	1		1		5
Trinity.....	1			1		2

^a Includes intermediate emergency fields of United States Civil Aeronautics Administration.

^b Includes United States and State Forest Service and National Park Service airports.

^c Includes surplus military fields with disposal pending by War Assets Administration at date of this report.

and in each case, these same counties lack adequate commercial airports to supply the need.

A qualitative analysis of this same 202 public airports is provided in Table 51, indicating a preponderance of Class 2 or smaller airports, with only 84 suitable for airline or cargo operations. However, a similar analysis of Commercial airports in Table 53, shows only five such airports meeting minimum air carrier requirements, making it patently evident that air transport is dependent upon public airports almost 100 percent in

California. In analyzing these same tables for distribution of suitable air carrier facilities, it appears that 15 counties are entirely lacking in facilities suitable for commercial operation. Three counties have no public or commercial airports, and nine others have no airports larger than Class 1, while two additional counties have no airports larger than Class 2. The distribution of adequate facilities throughout the State is therefore extremely poor.

TABLE 51

CALIFORNIA CIVIL AIRPORTS OF PUBLIC OWNERSHIP BY CLASSES—FOR AREAS AND COUNTIES—APRIL, 1947

Area Number County	C.A.A. Class							Total
	Sub. 1	1	Sub. 2	2	3	4	5 and Over	
California.....	20	35	22	41	18	35	31	202
Area 1. San Diego.....		4		2		2	2	10
Area 2. Los Angeles Metro- politan.....		5		4		6	3	18
Los Angeles.....				4		4	2	10
Orange.....		2				1		3
West Riverside.....		2						2
S.W. San Bernardino.....		1				1	1	3
Area 3. Desert.....			3	6	1	5	7	22
Imperial.....			2	1	1		1	5
Riverside.....				2		3	3	8
San Bernardino.....			1	3		2	3	9
Area 4. Kern.....	4	4	1	9	1	2	3	24
Area 5.....	2	1	1	1	3	8		16
Monterey.....	1				1	2		4
San Benito.....					1			1
San Luis Obispo.....			1	1	1	1		4
Santa Barbara.....	1	1				2		4
Santa Cruz.....						1		1
Ventura.....						2		2
Area 6.....	6	5	1	5	2	2	3	24
Fresno.....		1	1	4	1		1	8
Kings.....		1		1	1	1		4
Madera.....	1					1		2
Tulare.....	5	3					2	10
Area 7.....	2	2	2	1	1	1	1	10
Alpine.....								
Inyo.....	2	2	2	1	1	1	1	10
Mono.....								
Area 8.....		2	1	5	5	1	1	15
Calaveras.....								
Mariposa.....		1						1
Merced.....			1	5	1			7
San Joaquin.....					3	1		4
Stanislaus.....					1		1	2
Tuolumne.....		1						1

CALIFORNIA AIRPORTS

TABLE 51—Continued

CALIFORNIA CIVIL AIRPORTS OF PUBLIC OWNERSHIP BY CLASSES—FOR AREAS AND COUNTIES—APRIL, 1947

Area Number County	C.A.A. Class							Total
	Sub. 1	1	Sub. 2	2	3	4	5 and Over	
Area 9. San Francisco Met- ropolitan.....	1	2				4	3	10
Alameda.....							2	2
Contra Costa.....		1				1		2
Marin.....								
Napa.....						1		1
San Francisco.....							1	1
San Mateo.....						1		1
Santa Clara.....	1	1						2
Solano.....						1		1
Sonoma.....								
Area 10.....	1	3	3	1	2		3	13
Amador.....	1							1
El Dorado.....			1					1
Nevada.....		2						2
Placer.....		1	1		1			3
Sacramento.....					1		1	2
Sierra.....								
Sutter.....								
Yolo.....			1				1	2
Yuba.....				1			1	2
Area 11.....	1	4	2		2	2	(1)	11
Del Norte.....			1			1		2
Humboldt.....	1	3					(1)	4
Lake.....					1			1
Mendocino.....		1	1		1	1		4
Area 12.....				5	1	1	2	9
Butte.....							2	2
Colusa.....				1				1
Glenn.....				1		1		2
Tehama.....				3	1			4
Area 13.....	2		5	1		1	1	10
Lassen.....	1		2	1			1	5
Modoc.....	1		1			1		3
Plumas.....			2					2
Area 14.....	1	3	3	1			2	10
Shasta.....	1			1			1	3
Siskiyou.....		1	3				1	5
Trinity.....		2						2

Above table includes all city, county and state airports, Civil Aeronautics Administration intermediate fields, United States For-

est Service and National Park Service fields and surplus military fields with disposal pending at date of this report.

The extent to which California depends upon Public vs. Commercial or Private interest in the development of its airports is illustrated by Figure 5, which shows a breakdown by classes into the two categories and

includes private airports with commercial. It indicates that 41 percent of all civil airports are publicly owned or sponsored, with the greater percentage of public ownership in the higher classes.

CALIFORNIA CIVIL AIRPORTS OWNERSHIP BY CLASSES

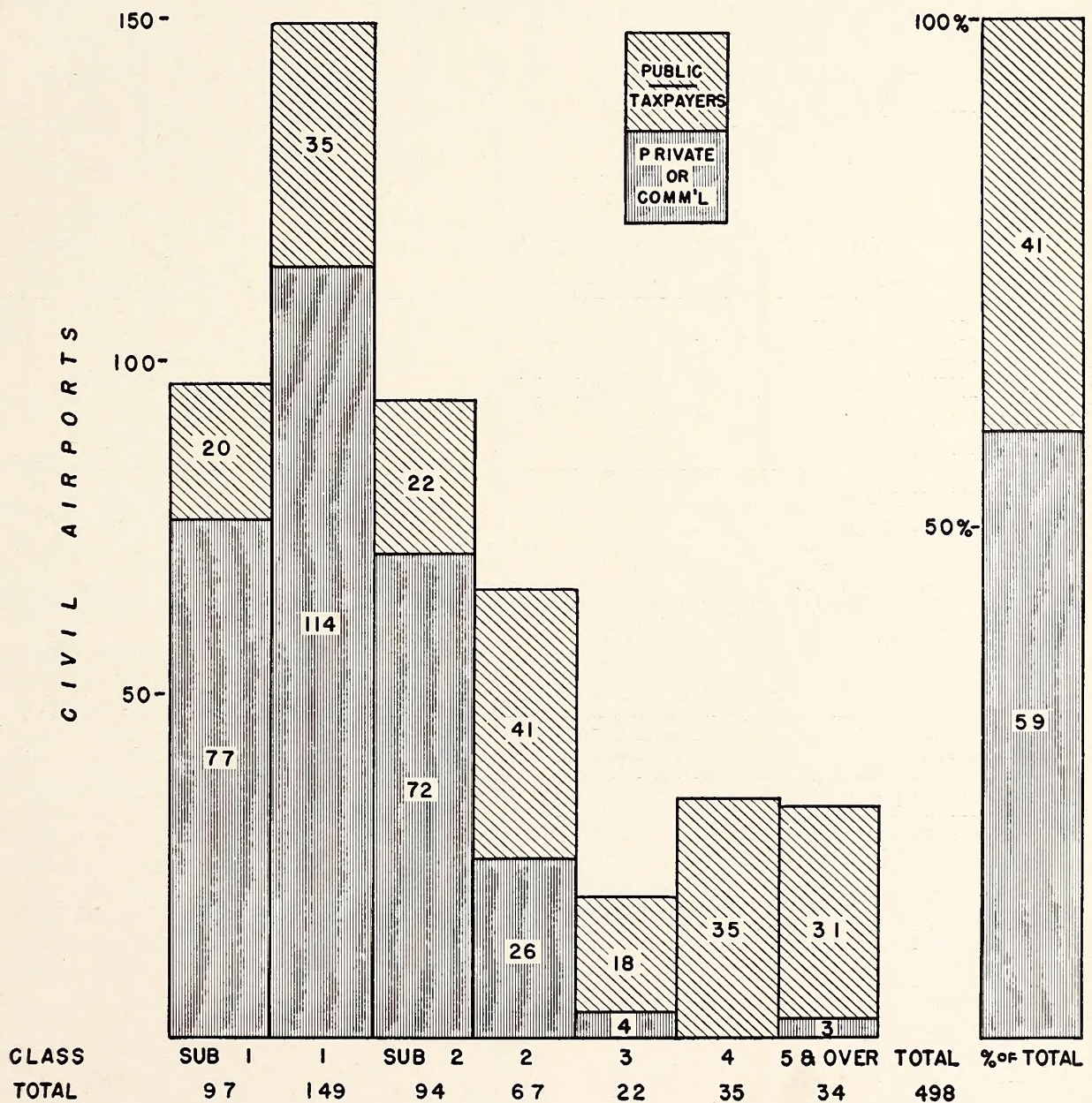


FIGURE 5

TABLE 52

CALIFORNIA CIVIL AIRPORTS—COMMERCIAL ONLY BY CLASSES—FOR AREAS AND COUNTIES—APRIL, 1947

Area Number County	C.A.A. Class							Total
	Sub. 1	1	Sub. 2	2	3	4	5 and Over	
California.....	32	88	59	23	3		2	207
Area 1. San Diego.....		11	3					14
Area 2. Los Angeles Metropolitan.....	9	22	12	10	1		2	56
Los Angeles.....	2	12	8	6	1		2	31
Orange.....	2	4	1	1				8
West Riverside.....	4	3	2	1				10
S.W. San Bernardino.....	1	3	1	2				7
Area 3. Desert.....	4	6	2	3	1			16
Imperial.....	2	1						3
Riverside.....	1	2	1	3				7
San Bernardino.....	1	3	1		1			6
Area 4. Kern.....		1		2	1			4
Area 5.....	2	10	4	1				17
Monterey.....		1	1					2
San Benito.....								
San Luis Obispo.....	1	1						2
Santa Barbara.....		2		1				3
Santa Cruz.....		3						3
Ventura.....	1	3	3					7
Area 6.....		6	9	5				20
Fresno.....		2	5	2				9
Kings.....			1	3				4
Madera.....								
Tulare.....		4	3					7
Area 7.....		2	1					3
Alpine.....								
Inyo.....		2	1					3
Mono.....								
Area 8.....	4	3	3					10
Calaveras.....	1							1
Mariposa.....								
Merced.....								
San Joaquin.....	1	1	3					5
Stanislaus.....	2	2						4
Tuolumne.....								
Area 9. San Francisco Metropolitan.....	9	15	12					36
Alameda.....		1	1					2
Contra Costa.....	2		2					4
Marin.....	2							2
Napa.....		2						2
San Francisco.....								
San Mateo.....	1	2	2					5
Santa Clara.....	2		5					7
Solano.....		5	2					7
Sonoma.....	2	5						7

TABLE 52—Continued

CALIFORNIA CIVIL AIRPORTS—COMMERCIAL ONLY BY CLASSES—FOR AREAS AND COUNTIES—APRIL, 1947

Area Number County	C.A.A. Class							Total
	Sub. 1	1	Sub. 2	2	3	4	5 and Over	
Area 10.....	1	6	5	2				14
Amador.....								
El Dorado.....								
Nevada.....	1							1
Placer.....		1						1
Sacramento.....		3	3					6
Sierra.....								
Sutter.....		1						1
Yolo.....		1	2	2				5
Yuba.....								
Area 11.....	2		3					5
Del Norte.....								
Humboldt.....			1					1
Lake.....			2					2
Mendocino.....	2							2
Area 12.....		2	5					7
Butte.....		1	2					3
Colusa.....			2					2
Glenn.....		1						1
Tehama.....			1					1
Area 13.....		1						1
Lassen.....								
Modoc.....								
Plumas.....		1						1
Area 14.....	1	3						4
Shasta.....		3						3
Siskiyou.....	1							1
Trinity.....								

Note: Above table includes all privately-owned commercial airports offering service to transient aircraft. Not included in this table are 89 private airports, affording emergency facilities only,

which appear in the area lists of airports. Although incomplete, this list includes: 45 Class Sub-1, 26 Class 1, 13 Class Sub-2, 2 Class 2, 1 Class Sub-3, 1 Class 3 and 1 Class 7.

In attempting to indicate a measure of actual coverage of the State, Table 53 was prepared to show in Column 3, the airport units per square mile, and in Column 4, the square miles per airport for each Area and County, with comparable State and National figures. While all classes of civil airports have equal weight in this table, it may be assumed that this factor cancels out in comparing the State figure of 383 square miles per airport, with the national figure of 851, which indicates that California is more than twice as well off as the Nation. However, when California's population density of 59.5 persons per square mile in comparison to a national density of 47.4 persons per square mile

is considered, the apparent advantage is nullified to a large extent. In determining the relative standing of the counties and areas as to airports per square mile, comparison was made in each case to the State average, for computation of the Density Index shown in Column 5 of Table 53. Disregarding population density for the moment, this column indicates that Area 7, the Inyo-Mono Area, has the fewest airports per square mile, at 35 percent of the State average, while Los Angeles Metropolitan Area 2 has the greatest density of airports with respect to area, at 396 percent of the State average.

CALIFORNIA AIRPORTS

TABLE 53
CALIFORNIA CIVIL AIRPORTS—DENSITY PER SQUARE MILE AND DENSITY INDEX—
BY AVIATION AREAS AND COUNTIES—APRIL, 1947

Area	County	Total Civil Airports *	Square Mile(s)			Density Index— Percent State Average
			Land Area, 1940 Census	Per Airport	Airports Per	
Column		1	2	3	4	5
United States.....		3,500	2,977,128	851	.0012	-----
California.....		409	156,803	383	.0026	100
Area 1. San Diego.....		24	4,258	177	.0056	215
Area 2. Los Angeles Metropolitan.....		74	7,153	97	.0103	396
Los Angeles.....		41	4,071	99	.0101	388
Orange.....		11	782	71	.0141	542
West Riverside*		12	1,400	117	.0086	331
S.W. San Bernardino*		10	900	90	.0111	427
Area 3. Desert.....		38	29,294	771	.0013	50
Imperial.....		8	4,284	536	.0019	73
Riverside*		15	5,779	385	.0026	100
San Bernardino*		15	19,231	1,282	.0008	31
Area 4. Kern.....		28	8,170	292	.0034	131
Area 5.....		33	13,087	397	.0025	96
Monterey.....		6	3,324	554	.0018	69
San Benito.....		1	1,396	1,396	.0007	27
San Luis Obispo.....		6	3,326	554	.0018	69
Santa Barbara.....		7	2,745	392	.0026	100
Santa Cruz.....		4	439	110	.0091	350
Ventura.....		9	1,857	206	.0054	208
Area 6.....		44	14,373	327	.0031	119
Fresno.....		17	5,985	352	.0028	108
Kings.....		8	1,395	174	.0057	219
Madera.....		2	2,148	1,074	.0009	35
Tulare.....		17	4,845	285	.0035	135
Area 7.....		13	13,859	1,066	.0009	35
Alpine.....			723			
Inyo.....		13	10,091	776	.0013	50
Mono.....			3,045			
Area 8.....		25	9,657	386	.0026	100
Calaveras.....		1	1,028	1,028	.0010	38
Mariposa.....		1	1,455	1,455	.0007	27
Merced.....		7	1,983	283	.0035	135
San Joaquin.....		9	1,410	157	.0064	246
Stanislaus.....		6	1,506	250	.0040	154
Tuolumne.....		1	2,275	2,275	.0004	15
Area 9. San Francisco Metropolitan.....		46	6,988	152	.0066	254
Alameda.....		4	733	183	.0055	212
Contra Costa.....		6	734	122	.0082	315
Marin.....		2	521	261	.0038	146
Napa.....		3	790	263	.0038	146
San Francisco.....		1	45	45	.0222	854
San Mateo.....		6	454	76	.0132	508
Santa Clara.....		9	1,305	145	.0069	265
Solano.....		7	827	118	.0085	327
Sonoma.....		8	1,579	197	.0051	196

TABLE 53—Continued
 CALIFORNIA CIVIL AIRPORTS—DENSITY PER SQUARE MILE AND DENSITY INDEX—
 BY AVIATION AREAS AND COUNTIES—APRIL, 1947

Area	County	Total Civil Airports a	Square Mile(s)			Density Index— Percent State Average
			Land Area, 1940 Census	Per Airport	Airports Per	
Column		1	2	3	4	5
Area 10.....		27	8,951	332	.0030	115
Amador.....		1	594	594	.0017	65
El Dorado.....		1	1,725	1,725	.0006	23
Nevada.....		3	979	326	.0031	119
Placer.....		4	1,431	358	.0028	108
Sacramento.....		8	985	123	.0081	312
Sierra.....			958			
Sutter.....		1	607	607	.0016	62
Yolo.....		7	1,034	148	.0068	262
Yuba.....		2	638	319	.0031	119
Area 11.....		16	9,342	584	.0017	65
Del Norte.....		2	1,003	502	.0020	77
Humboldt.....		5	3,573	714	.0014	54
Lake.....		3	1,256	419	.0024	92
Mendocino.....		6	3,510	585	.0017	65
Area 12.....		16	7,109	444	.0023	88
Butte.....		5	1,665	333	.0030	115
Colusa.....		3	1,153	384	.0026	100
Glenn.....		3	1,317	439	.0023	88
Tehama.....		5	2,974	595	.0017	65
Area 13.....		11	11,212	1,019	.0010	38
Lassen.....		5	4,548	910	.0011	42
Modoc.....		3	4,094	1,365	.0007	27
Plumas.....		3	2,570	857	.0012	46
Area 14.....		14	13,350	954	.0010	38
Shasta.....		6	3,846	641	.0016	62
Siskiyou.....		6	6,313	1,052	.0010	38
Trinity.....		2	3,191	1,596	.0006	23

* Estimated apportionment of county totals for Riverside and San Bernardino between Areas 2 and 3.

a Includes city and county, commercial, federal and state airports shown in Columns 1, 2 and 3 of Table 49. Omits private and military airports.

c Estimated national equivalent of a above from July 1, 1946, total of 4,306 airports shown on CAA Statistical Handbook—October, 1946, Supplement.

In Table 54 airports are related to population, on the basis of units per 100,000 persons. Again, the density index is obtained by comparison of each area to the State average. In this case we find that Areas 7 and 2 have reversed their positions, Area 7 having the highest standing on the basis of airports per 100,000 persons, with 25 times the State average, while Area 2 is in the bottom position with only 41 percent of the State average. It therefore appears that the best measure of the actual standing of the several areas and counties, with

respect to the adequacy of their existing airports, is to be found in a simultaneous consideration of the two indices enumerated above. Those areas and counties having the highest airport-population index, and also having an airport-area index at or above the State average, should be considered as having the best balanced, and highest development insofar as airports as units are concerned. Plate N shows the relative population-per-airport density of the several counties of California upon this unit basis.

CALIFORNIA AIRPORTS

TABLE 54
CALIFORNIA CIVIL AIRPORTS PER CAPITA BY AREAS AND COUNTIES
WITH AIRPORT PER CAPITA INDEX—APRIL, 1947

Area County	Total Civil Air- ports ^a	Population Estimates July 1, 1946 ^b	Airports per 100,000 Persons	Per Capita Index- Percent of State Average	Area County	Total Civil Air- ports ^a	Population Estimates July 1, 1946 ^b	Airports per 100,000 Persons	Per Capita Index- Percent of State Average
Column	1	2	3	4	Column	1	2	3	4
United States.....	3,500	141,000,000	2.482	-----	California.....	409	9,335,000	4.381	100
Area 1. San Diego.....	24	470,500	5.100	116	Area 9. San Fran- Francisco Met- ropolitan.....	46	2,515,150	1.829	42
Area 2. Los Angeles Metropolitan.....	74	4,089,555	1.809	41	Alameda.....	4	721,500	.554	12
Los Angeles.....	41	3,597,500	1.140	26	Contra Costa.....	6	278,500	2.154	49
Orange.....	11	170,700	6.444	147	Marin.....	2	75,600	2.646	60
West Riverside.....	12	108,375	11.073	253	Napa.....	3	42,700	7.026	160
S.W. San Ber- nardino.....	10	212,960	4.696	107	San Francisco.....	1	775,000	.129	3
Area 3. Desert.....	38	121,865	31.182	712	San Mateo.....	6	179,000	3.352	77
Imperial.....	8	56,700	14.109	322	Santa Clara.....	9	236,000	3.814	87
Riverside.....	15	36,125	41.522	948	Solano.....	7	119,750	5.846	133
San Bernardino.....	15	29,040	51.652	1,179	Sonoma.....	8	87,100	9.185	210
Area 4. Kern.....	28	192,000	14.583	333	Area 10.....	27	386,140	6.992	160
Area 5.....	33	400,650	8.237	188	Amador.....	1	8,200	12.195	278
Monterey.....	6	103,000	5.825	133	El Dorado.....	1	14,850	6.734	154
San Benito.....	1	14,450	6.920	158	Nevada.....	3	19,400	15.464	353
San Luis Obispo.....	6	47,000	12.766	291	Placer.....	4	35,250	11.348	259
Santa Barbara.....	7	87,700	7.982	182	Sacramento.....	8	224,000	3.571	82
Santa Cruz.....	4	58,000	6.897	157	Sierra.....	1	2,490	-----	-----
Ventura.....	9	90,500	9.945	227	Sutter.....	1	24,900	4.016	92
Area 6.....	44	459,400	9.578	219	Yolo.....	7	34,300	20.408	466
Fresno.....	17	237,500	7.158	163	Yuba.....	2	24,750	8.081	184
Kings.....	8	44,400	18.018	411	Area 11.....	16	101,250	15.802	361
Madera.....	2	32,500	6.154	140	Del Norte.....	2	5,100	39.215	895
Tulare.....	17	145,000	11.724	268	Humboldt.....	5	51,950	9.625	220
Area 7.....	13	11,485	113.191	2,584	Lake.....	3	10,750	27.907	637
Alpine.....	-----	285	-----	-----	Mendocino.....	6	33,450	17.937	409
Inyo.....	13	9,800	132.653	3,028	Area 12.....	16	95,050	16.833	384
Mono.....	-----	1,400	-----	-----	Butte.....	5	53,100	9.416	215
Area 8.....	25	388,900	6.428	147	Colusa.....	3	10,000	30.000	685
Calaveras.....	1	9,450	10.582	242	Glenn.....	3	15,350	19.544	446
Mariposa.....	1	4,300	23.255	531	Tehama.....	5	16,600	30.120	688
Merced.....	7	55,500	12.613	288	Area 13.....	11	40,150	27.397	625
San Joaquin.....	9	192,000	4.688	107	Lassen.....	5	19,000	26.316	601
Stanislaus.....	6	116,650	5.144	117	Modoc.....	3	9,650	31.088	710
Tuolumne.....	1	10,950	9.132	208	Plumas.....	3	11,500	26.087	595
					Area 14.....	14	62,925	22.249	508
					Shasta.....	6	29,450	20.374	465
					Siskiyou.....	6	29,400	20.408	466
					Trinity.....	2	4,075	49.079	1,120

^a Includes city and county, commercial, federal and state airports shown in Columns 1, 2 and 3 of Table 49. Omits private and military airports.

^b From July 1, 1946, Population Estimates—Table 34.

^c Estimated national equivalent of ^a above from July 1, 1946, total of 4,306 airports shown in CAA Statistical Handbook—October, 1946, Supplement.

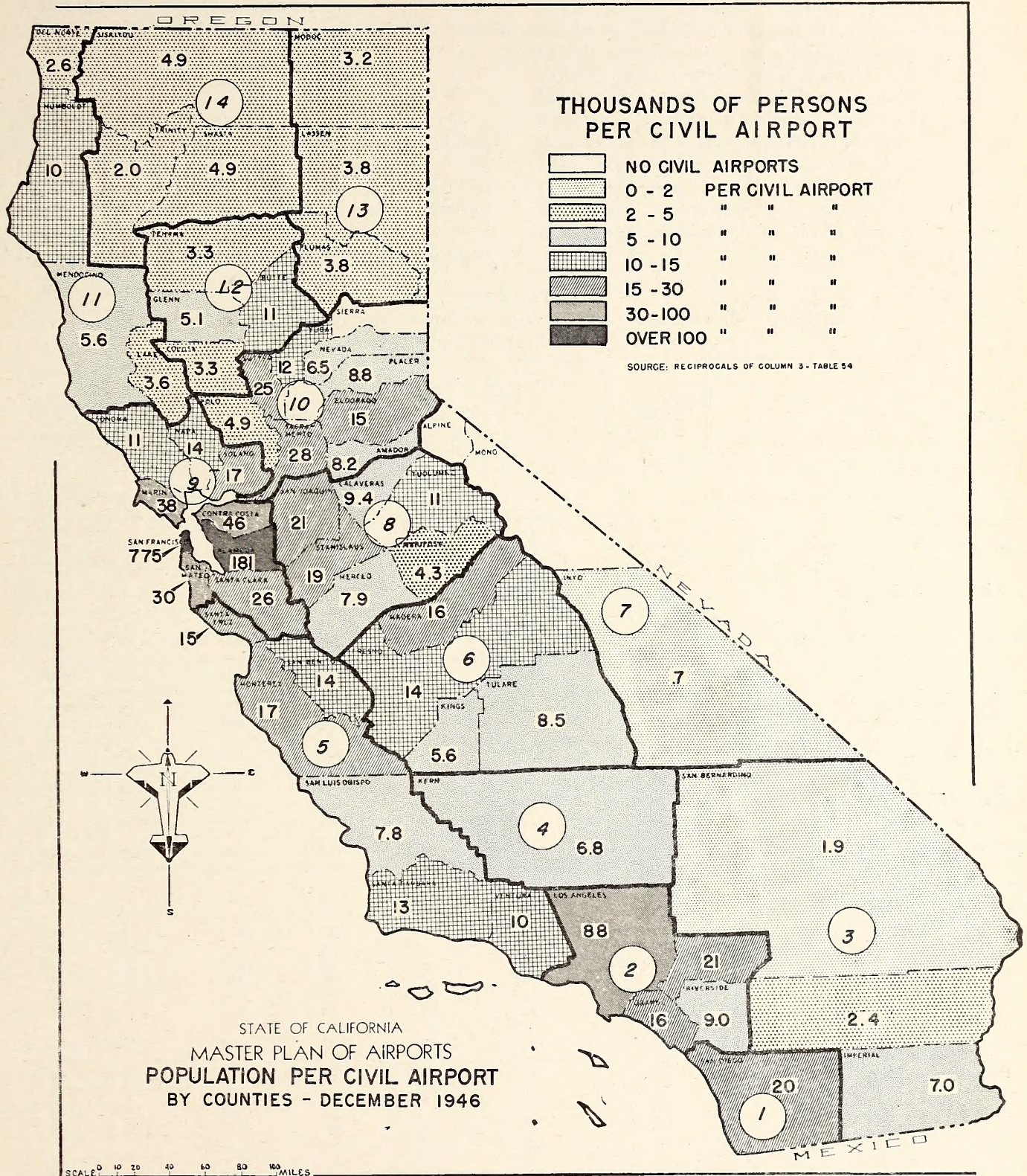


PLATE N

But, as has been indicated from the previous tables of airport inventory, the areas and counties vary widely with respect to the quality of their airports. Merely having the *most* airports is not a true measurement of relative position. Hence it is necessary that the several classes of airports be weighted in proportion to their capacity to serve the community. Table 55 applies such a system of weight to each airport of each class in the several counties and thus arrives at area totals. The basis for weighting assumes an average capacity of 25 based aircraft per unit weight assigned, and results in the following factors:

Class	Weight Factor	Class	Weight Factor
Sub 1	2	Sub 3	6
1	3	3	8
Sub 2	4	4	10
2	5	5 and over	12

After applying these factors individually to the public airports listed in Table 51, the weighted values shown in Column 2 of Table 55 were obtained. Similarly, Column 3 was derived from the Commercial Airports of various classes shown in Table 52. The totals in Column 4 were then divided by their respective populations in thousands to obtain the weighted ratio

TABLE 55
CALIFORNIA CIVIL AIRPORTS—WEIGHTED INVENTORY WITH RATIO TO POPULATION
AND RANK OF COUNTIES—APRIL, 1947

Area County	Population, 1946 Table 34	Civil Airports, Weighted Value			Weighted Value Per 1,000 Persons	Ratio to State Average	Order of (Areas), County
		Public, Table 51	Commercial, Table 52	Total			
Column	1	2	3	4	5	6	7
California.....	9,335,000	1,316	727	2,043	.219	1.00	-----
Area 1. San Diego.....	470,500	66	45	111	.236	1.08	45 (12)
Area 2. Los Angeles Metropolitan.....	4,089,535	131	214	345	.084	.38	(13)
Los Angeles.....	3,597,500	84	134	218	.061	.28	54
Orange.....	170,700	16	25	41	.240	1.09	44
West Riverside.....	108,375	6	30	36	.332	1.52	37
S.W. San Bernardino.....	212,960	25	25	50	.235	1.07	46
Area 3. Desert.....	121,865	184	57	241	1.978	9.03	(2)
Imperial.....	56,700	33	7	40	.705	3.22	19
Riverside.....	36,125	76	27	103	2.851	13.02	3
San Bernardino.....	29,040	75	23	98	3.375	15.41	2
Area 4. Kern.....	192,000	133	21	154	.802	3.66	18 (7)
Area 5.....	400,650	120	55	175	.437	2.00	(9)
Monterey.....	103,000	30	7	37	.359	1.64	34
San Benito.....	14,450	8	-----	8	.554	2.53	25
San Luis Obispo.....	47,000	27	5	32	.681	3.11	22
Santa Barbara.....	87,700	25	11	36	.410	1.87	31
Santa Cruz.....	58,000	10	9	19	.328	1.50	38
Ventura.....	90,500	20	23	43	.475	2.17	28
Area 6.....	459,400	128	79	207	.451	2.06	(8)
Fresno.....	237,500	47	36	83	.349	1.59	35
Kings.....	44,400	26	19	45	1.014	4.63	13
Madera.....	32,500	12	-----	12	.369	1.68	33
Tulare.....	145,000	43	24	67	.462	2.11	29
Area 7.....	11,485	53	10	63	5.485	25.05	(1)
Alpine.....	285	-----	-----	-----	-----	-----	-----
Inyo.....	9,800	53	10	63	6.429	29.36	1
Mono.....	1,400	-----	-----	-----	-----	-----	-----

TABLE 55—Continued
 CALIFORNIA CIVIL AIRPORTS—WEIGHTED INVENTORY WITH RATIO TO POPULATION
 AND RANK OF COUNTIES—APRIL, 1947

Area	County	Population, 1946 Table 34	Civil Airports, Weighted Value			Weighted Value Per 1,000 Persons	Ratio to State Average	Order of (Areas), County
			Public, Table 51	Commercial, Table 52	Total			
Column		1	2	3	4	5	6	7
Area 8.....		388,900	97	29	126	.324	1.48	(11)
Calaveras.....		9,450		2	2	.212	.97	47
Mariposa.....		4,300	3		3	.698	3.19	20
Merced.....		55,550	37		37	.666	3.04	23
San Joaquin.....		192,000	34	17	51	.266	1.21	41
Stanislaus.....		116,650	20	10	30	.257	1.17	42
Tuolumne.....		10,950	3		3	.274	1.25	39
Area 9. San Francisco Metropolitan.....		2,515,150	84	111	195	.078	.36	(14)
Alameda.....		721,500	24	7	31	.043	.20	56
Contra Costa.....		278,500	13	12	25	.090	.41	53
Marin.....		75,600		4	4	.053	.24	55
Napa.....		42,700	10	6	16	.375	1.71	32
San Francisco.....		775,000	12		12	.015	.07	57
San Mateo.....		179,000	10	16	26	.145	.66	50
Santa Clara.....		236,000	5	24	29	.123	.56	51
Solano.....		119,750		23	23	.192	.87	48
Sonoma.....		87,100	10	19	29	.333	1.52	36
Area 10.....		386,140	80	50	130	.337	1.54	(10)
Amador.....		8,200	2		2	.244	1.11	43
El Dorado.....		14,850	4		4	.269	1.23	40
Nevada.....		19,400	6	2	8	.412	1.88	30
Placer.....		33,250	15	3	18	.541	2.47	26
Sacramento.....		224,000	20	21	41	.183	.84	49
Sierra.....		2,490						
Sutter.....		24,900		3	3	.120	.55	52
Yolo.....		34,300	16	21	37	1.079	4.93	12
Yuba.....		24,750	17		17	.687	3.14	21
Area 11.....		101,250	70	16	86	.849	3.88	(6)
Del Norte.....		5,100	14		14	2.745	12.53	4
Humboldt.....		51,950	23	4	27	.520	2.37	27
Lake.....		10,750	8	8	16	1.488	6.79	7
Mendocino.....		33,450	25	4	29	.867	3.96	17
Area 12.....		95,050	67	26	93	.978	4.47	(5)
Butte.....		53,100	24	11	35	.659	3.01	24
Colusa.....		10,000	5	8	13	1.300	5.94	10
Glenn.....		15,350	15	3	18	1.173	5.36	11
Tehama.....		16,600	23	4	27	1.627	7.43	6
Area 13.....		40,150	51	3	54	1.345	6.14	(3)
Lassen.....		19,000	27		27	1.421	6.49	9
Modoc.....		9,650	16		16	1.658	7.57	5
Plumas.....		11,500	8	3	11	.957	4.37	15
Area 14.....		62,925	52	11	63	1.001	4.57	(4)
Shasta.....		29,450	19	9	28	.951	4.34	16
Siskiyou.....		29,400	27	2	29	.986	4.50	14
Trinity.....		4,075	6		6	1.472	6.72	8

Note: In weighting the existing civil airports, public and commercial, shown in Tables 51 and 52, to arrive at value shown in Column 2, 3 and 4 above, the following arbitrary factors indicative of the capacities of the several classes of airports were used:

Class Sub 1.....	Factor	2	Class 3.....	Factor	8
Class 1.....	Factor	3	Class 4.....	Factor	10
Class Sub 2.....	Factor	4	Class 5 and over.....	Factor	12
Class 2.....	Factor	5			

to population shown in Column 5. Again the index was obtained by ratio to the State average. Although the relative standing of the areas changed very slightly from the previous table, the weighting served to further reduce the effective airports per capita in Los Angeles Metropolitan Area 2 and in San Francisco Bay Area 9, and to increase the effective airports per capita in six areas as shown by the following tabulation of Indices:

Area Number and Name	Air- port per Square Mile Index (Table 53)	Airport-Popula- tion Index		Rank
		Units (Table 54)	Weighted Units (Table 55)	
1. San Diego Metropolitan	215	116	108	3
2. Los Angeles Metropolitan.....	396	41	†38	13
3. Desert.....	50	712	903	9
4. Kern County.....	131	335	*366	1
5. Mid Coastal.....	96	188	200	7
6. Fresno Metropolitan....	119	219	*206	2
7. Inyo-Mono.....	35	2,584	2,505	8
8. Stockton Metropolitan..	100	147	*148	5
9. San Francisco Bay.....	254	42	†36	14
10. Sacramento Metropolitan.....	115	160	*154	4
11. Redwood Empire.....	65	361	388	10
12. Chico-Red Bluff.....	88	384	447	6
13. Modoc Plateau.....	38	625	614	11
14. Shasta Cascade.....	38	508	457	12

* Most advantageous airport coverage.

† Least advantageous airport coverage.

In the above listing, areas have been ranked in order of their airport adequacy, upon the two bases of area coverage and weighted airport units per unit of population. Extremes in either basis have been given low rank, since the desirable goal is to achieve both adequate area coverage and sufficient airports to care for the population need. The study therefore warrants the following observations:

(1) Areas, 4, 6, 1, 10, 8, 12 and 7 in the order named, presently possess the more adequate airport inventory, both from the standpoint of desirable coverage and suitable units with relation to population.

(2) This condition is obviously due to the concentration of wartime airport construction in those areas, and the present availability of surplus military airfields.

(3) Desert and mountainous regions, having low population density—Areas 7, 3, 11, 13 and 14 in the order named—have desirably high ratio of airports to their sparse population, but decreasingly poor area coverage, indicating a probable need for emergency fields in isolated sections of these areas, to complete the coverage pattern.

(4) Los Angeles Metropolitan Area 2 and San Francisco Bay Area 9, having high population density in restricted confines, present the major problem con-

fronting the State in the development of adequate airport facilities. Although both have relatively high airport-area indices, the supply of airports with respect to population is abnormally low.

(5) Concentration of almost 71 percent of the State's population within 9 percent of its territory (Table 36), as is the case in Areas 2 and 9 combined, focuses attention upon these areas as being most in need of, and most difficult to provide with, the airport facilities necessary to achieve adequate and uniform coverage throughout the State.

The observations above noted have been given due consideration in the Area Treatments of the Appendix and will be evaluated further in the following section dealing with non-scheduled aviation.

As an indication of the standing of California, with respect to its sister states, the latest breakdown of airports by states in Civil Aeronautics Administration Statistical Handbook of 1946, indicates a rank of 21st on an airport-per-population basis and 26th on an airport-per-square mile basis.

War Surplus

As recorded in Section 3 of Part I, one hundred nine new military airfields and auxiliary fields were constructed in California during the late war, of which 76 have been declared excess to present military requirements. Of this number, 42 have been allocated to cities or counties on interim permits or by grant deed. There remains a total of 34 such airfields—largely of the auxiliary type—which, as of April 1, 1947, were awaiting disposal under the War Assets Administration. Suitable governmental sponsoring agencies had not been found who could meet the terms of the Federal disposal program. The list included:

- 1—Class S-1 (Since allocated to Watsonville)
- 3—Class 1
- 20—Class 2
- 1—Class 3
- 6—Class 4
- 3—Class 5

Individual locations may be ascertained by reference to the Area Lists of Airports, where the fields are identified by the special symbol “†”. Several of the sites have been recommended for disposal as “non-airport” property, and will undoubtedly revert to other uses. Other locations such as Desert Center Army Air Field, Shavers Summit, Rice and Victory Fields, should be preserved for their value as civil emergency fields and for future national emergency use.

It is therefore recommended that responsible public officials in the several counties assume the responsibility for perpetuating such of these war-surplus airports as possess potential value to future civil or military aviation.

In addition to new military fields established during the war, 58 civil and commercial airports were occupied to a greater or lesser degree by the Army,

Navy or Marine Air Services. All, except four, of those airports have now been returned to their original owners, together with improvements added during occupancy, and they are now available to expanding civil aviation. Meanwhile, their value as assets to National Defense has been proved and they remain available for future emergencies.

Inadequacies of Present Coverage

As was pointed out in the above ANALYSIS, the heavily populated urban centers represented by Area 2 (Los Angeles Metropolitan) and Area 9 (San Francisco Bay Counties) are most seriously in need of additional airport facilities to meet the anticipated growth of both branches of Civil Aviation—scheduled and non-scheduled.

Area 2—This area has 74 civil airport units (public and commercial), or 18 percent of the State's total. As is shown in the following Section 4 (Table 60) it now lists 3,838, or 53 percent of the State's registered aircraft—an average of 52 aircraft per airport for the area, compared to an average of 18 for the State. In Los Angeles County the situation is even more acute, with 46 percent of the State's aircraft concentrated on 10 percent of its airport units, for a density of 81 aircraft per unit in October, 1946—a number which now approximates 100 per unit. The 10 public and 31 commercial airport units upon which Los Angeles County aviation depends (Tables 51 and 52) consist of the following classes:

	S-1	1	S-2	2	3	4	5 and over	Total
Public	-	-	-	4	-	4	2	10
Commercial	2	12	8	6	1	-	2	31
Total	2	12	8	10	1	4	4	41
Weighted value	4	36	32	50	8	40	48	218

When the weighted value or actual relative capacity, of these units (218 shown above) is compared to the weighted value of all airports in the State (2,043—Table 55), the county's position is only slightly improved to 10.7 percent of the State's total airport capacity. Upon a per capita weighted value, or per capita capacity basis (Column 5, Table 55) the county is only 28 percent as well off as the State at large which, in effect, reduces the above 10.7 percent to 3 percent of the State's per capita airport capacity.

There can be no denial of the fact that the airports of Los Angeles County are at or near capacity. In view of the present situation, a glimpse of the potential registration of 9,388 aircraft in 1950 and 19,505 in 1955 (Table 73), clearly indicates the need for speedy and drastic action to develop at least 50 Class 1 airports (or airparks) by 1950, and at least 100 similar additional facilities by 1955 in Los Angeles County alone, if non-scheduled aviation is to attain its possibilities.

Scheduled air transport in the Los Angeles Metropolitan Area is also concerned with the need for developing additional facilities for necessary new main and feeder line stops, for alternate terminals under adverse weather conditions, and for the elimination of all non-scheduled traffic from the major air terminals.

The Los Angeles Metropolitan Area needs a long range, constructive and aggressive approach to its airport problems, comparable to that now being undertaken for the New York Area by the Port of New York Authority. Its Master Plan of Airports of 1940, an excellent study in its day, included only Los Angeles County, and anticipated 5,000 registered aircraft by 1950, a number which will be reached during 1947, if not already attained. The plan showed 26 existing airports in 1940, of which 8 have since been swallowed by real-estate development, and one other has become a permanent Navy establishment. Of the 15 remaining, 9 have since reached or surpassed the standards recommended, while 6 are still sub-standard. Seventeen new airports were proposed in the 1940 plan, of which only 7 (2 public and 5 commercial) have since been built. Nine other airports, chiefly located in the Palmdale area, and not included in the 1940 plan, complete the county's total of 41 public and commercial airports. The 1946 revision of this plan consisted of a map (Appendix 2) bringing existing airports up to date, and indicating suitable general locations for approximately 30 additional airports and airparks.

Area 9—A situation similar to that above described exists in Area 9, and is peculiar to the three San Francisco peninsula counties of San Francisco, San Mateo and Santa Clara, where 7 percent of the State's registered aircraft are concentrated on 3.9 percent of its airport units. Again, by weighting these units to indicate their capacity, we find that they represent only 3.3 percent of the State's airport capacity. The October, 1946 estimate of aircraft for these counties totals 505 for 16 airports, or 31 aircraft per airport average.

Existing airports consist of the following:

	S-1	1	S-2	2	3	4	5 and over	Total
Public	1	1	-	-	-	1	1	4
Commercial	3	2	7	-	-	-	-	12
Total	4	3	7	-	-	1	1	16
Weighted value	8	9	28	-	-	10	12	67

The weighted value of 67 gives a value per thousand of population of .056, which is 26 percent of the State's per capita weighted value for existing civil airports. Hence, these counties have less than 1 percent of the State's per capita airport capacity.

The need for improved airport facilities in this district has been recognized by the City of San Jose, and by the county officials of each of the three counties where master plans, county-wide in scope, are in preparation. However, there remains the need for an overall airport plan and authority, embracing all of Area

9 in order that a coordinated system may be developed which will be truly representative of the Area's needs, without expensive duplication or unwise expenditures. The projected aircraft ownership for this Area indicates 3,826 aircraft registrations by 1950 and 8,640 by 1955. Appendix 9 deals more in detail with the problems posed.

Areas 13 and 14—Here the problem is one of inadequate coverage of areas having low population density, mountainous terrain and high interest in aeronautics due to its serviceability to the more remote cities and towns of the State. Greater coverage would automatically provide greater convenience to users of aircraft and make possible the increased utilization of aircraft in these areas, far out of proportion to their population.

While one adequate feeder line airport now exists in Area 13, others are needed in Lassen and Plumas Counties to care for feeder service already in prospect. Similarly, a suitable feeder line airport is needed in Area 14 at Dunsmuir for service already authorized. Throughout these Areas there is a serious dearth of forest service and recreational airports.

Area 11—The north coastal or Redwood Empire region of California is adequately supplied with air-

ports at its principal population centers, which are suitable for, and presently used by, both main and feeder line aircraft. Its lack is apparent in its low area coverage for convenience of access to its heavily forested recreational areas. California's valuable redwood forests yearly suffer heavy fire loss and airports to suit the needs of the forest services will also serve recreational areas and the needs of scattered local aviation interests.

General—All of the counties comprising the western slope of the Sierra Nevada mountains lack adequate airport facilities for non-scheduled aviation, and afford no facilities for the large aircraft of feeder lines or charter services. Consequently, this territory, rich in scenic, recreational and historic interest, is largely inaccessible to the air traveller. It appears reasonable and logical that each county seat of this region have at least a Class 3 airport, and that each of its four National Parks be provided with suitable facilities in close proximity. All of these requirements are given consideration in the treatments of the appropriate areas, to the end that a complete and well-coordinated system of airports be provided under California's allocation of Federal aid in the Federal Airport Program.

3. SCHEDULED AIR TRANSPORT

Foreign

Foreign air transport as it applies to California air commerce began about 1928 with the inauguration of several uncertificated services between California and Mexican cities. Lacking mail or other subsidies most of these services were short lived. The first certificated foreign route connecting California with Central and South American cities was Pan American Airways subsidiary, Cia Mexicana de Aviacion, which has operated continuously between Los Angeles and Mexico City for approximately fifteen years, developing from tri-weekly service to twice-daily service during that interval. One daily flight now utilizes DC-4 equipment operating non-stop between Los Angeles and Mexico City. More recently American Airlines has operated daily service between Los Angeles and Mexico City via El Paso, Texas.

Trans-Pacific mail and cargo service from San Francisco to the Philippine Islands was inaugurated by Pan-American Airways flying boat on November 22, 1935 on an experimental irregular basis. Approximately one year later regular passenger and mail service across the Pacific became a reality and similar service to Australia soon followed. This phase of foreign air service was well established at the outbreak of World War II and became the nucleus of a vast system of air transport which played an important part in our winning

that conflict. Flying boats gave way to multi-engined land planes for long overwater flights; range, speed and efficiency were vastly improved; and with the return of peaceful pursuits, there is high optimism for an era of foreign commerce in the Pacific in which air transport will play a leading role and which will prove of principal benefit to California and the Pacific coast region.

Foreign air transport potential is discussed at length in Section 5 of Part V.

Domestic

Air Transport Service in California will be 27 years old on September 8, 1947, for on that date in 1920 the first transcontinental air mail schedule of the United States Post Office Department reached San Francisco. Carriage of air mail only continued under government operation until early in 1926 when the service was transferred to private contractors and the first cautious ventures into the field of passenger transportation by air began. On May 23, 1926, Western Air Express, holder of the new contract No. 4 between Los Angeles and Salt Lake City, carried its first revenue passengers between its terminal points.

Other pioneer air transport lines affecting the early development of transport aviation in California and neighboring states are included in the following list:

PIONEER AIR TRANSPORT LINES IN CALIFORNIA

Service Began	Route	Miles	Service	Schedule	Operator
1919, July 1	New York-Chicago	712	Mail	Daily	U. S. Postoffice Dept.
1920, September 8	Chicago-San Francisco	1,949	Mail	Daily	U. S. Postoffice Dept.
1926, April	Contract carriage of Air Mail inaugurated.				
1926, April 17	Los Angeles-Salt Lake	633	MPE	Daily	Western Air Express
1926, September 15	Los Angeles-Seattle	1,080	MPE	Daily	Pacific Air Transport
1927, March	Wilmington-Avalon	32	PE	Variable	Pacific Marine Airways
1927, July 1	Chicago-San Francisco	1,949	MPE	Daily	Boeing Air Transport
1927, November 1	Los Angeles-San Diego	115	P	Daily	Maddux Air Lines
1927, November 28	Los Angeles-Tucson	440	PE	Tri-Weekly	Standard Airlines
1928, March 5	San Francisco-Portland	549	PE	Tri-Weekly	West Coast Air Transport
1928, April 14	Los Angeles-San Francisco	378	P	Daily	Maddux Air Lines
1928, May 26	Los Angeles-San Francisco	378	PE	Daily	Western Air Express
1928, July 4	San Diego-Agua Caliente	14	P	Daily	Maddux Air Lines
1928, November 15	Los Angeles-Palm Springs	110	P	Daily	Maddux Air Lines
1929, February 10	Los Angeles-Phoenix	360	PE	Daily	Maddux Air Lines
1929, June 1	Los Angeles-Kansas City	1,266	P	Daily	Western Air Express
1929, July 8	Los Angeles-Columbus, Ohio	1,837	P	Daily	Transcontinental Air Transport
	(Combination Plane and Train)				

While the transportation of passengers continued on a small scale between Los Angeles—Salt Lake and Los Angeles—Seattle in the limited capacity aircraft available, it was not until November 1, 1927 that the first "luxury" service was inaugurated by Maddux Airlines between Los Angeles and San Diego with the advent of the tri-motored Ford—that early-day work horse of the airways, and forerunner of the modern transport airplane.

Following in rapid succession came tri-weekly service from Los Angeles to Tucson by Standard Airlines and daily passenger service, also by Maddux, between Los Angeles and San Francisco. Public acceptance of this new transportation service is indicated in Table 64 showing the historical growth of air transport in the United States. From this modest start the passengers and mail carried increased almost 60 times by 1930. The expansion continued at a more moderate pace during the depression years of 1930-35 but again renewed its sharp annual rise in 1935 for another 20 fold increase through 1946.

Plate O depicts the service pattern of the scheduled air carriers now serving California and in connection with Table 56 it indicates the daily service available at each station served as well as the air transport companies affording service at each point.

It indicates that 37 California cities are now served directly by a total of 906 daily arrivals and departures with the major terminals of Los Angeles, San Francisco, Oakland and San Diego contiguous to 75 percent of the State's population receiving 71 percent of the service.

Six of California's seven cities of over 100,000 population enjoy regular service from major air carriers while the seventh—Berkeley—centers approximately 11 miles from the Oakland airport and lies wholly within its service radius.

While only five of California's 23 cities in the 25 to 100,000 population group enjoy direct mainline air

carrier service and two others have feeder service, all but two are contiguous to and within a 20 mile service area of other mainline air carrier stops. The two exceptions are Riverside and San Bernardino. Service has been authorized to these cities but is not yet available due to lack of adequate civil airport facilities. Santa Ana lies 15 miles from the Long Beach airport, is the hub of a populous and prosperous community which will soon demand adequate air service. A suitable facility is available in Orange County Airport. Other cities on the fringe insofar as air carrier service is concerned are Pasadena, Alhambra and all of eastern Los Angeles.

Of California's 52 cities in the 10,000 to 25,000 population group, only six have direct mainline air carrier service while seven enjoy feeder service and two have both services. Again most of the others lie within the service area of neighboring mainline or feederline stops although several are near the fringe of such areas, notably those contiguous to Los Angeles on the east. Several large centers, namely Pomona, Ontario, Colton, Redlands and Oceanside in this group lack suitable air carrier service.

Mainline service is available directly to two cities and feederline service to four cities in the 5,000 to 10,000 population group which totals 52 cities. Seventeen percent of these cities are outside of a 25 mile radius from existing air carrier or feeder stops.

In the final group of 46 urban places under 5,000 population, one has mainline service, two isolated cities now enjoy feederline service while two non-urban towns of less than 2,500 population, also in isolated areas, are similarly served. In each instance these smaller isolated places are productive of an inordinately large volume of passenger and mail traffic lending support to proponents of feeder service to similar isolated sections of the State not now enjoying air transport service—particularly Areas 7 and 13. A complete projection of air carrier potentials for all such points is presented in Table 68 of Part V.

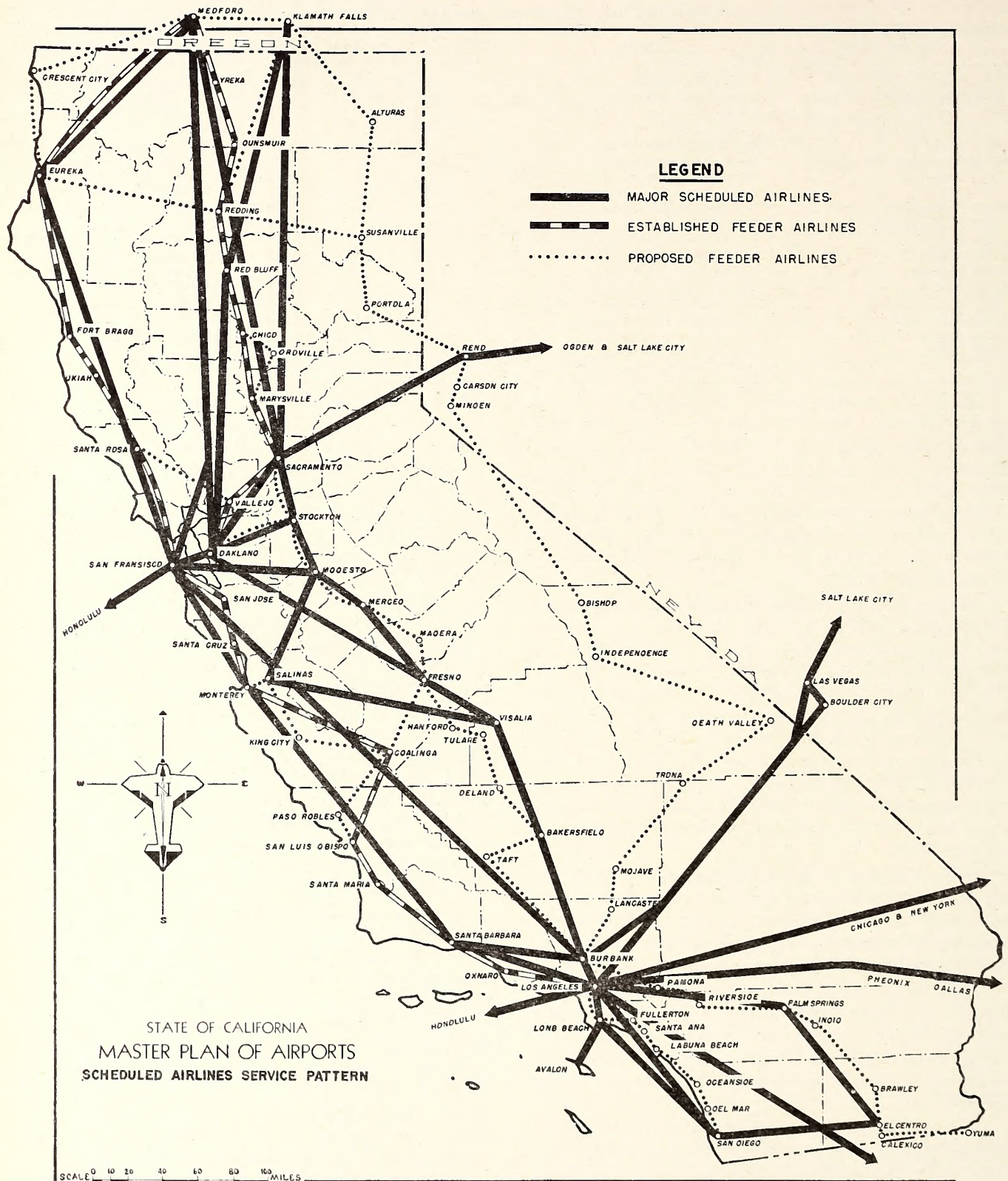


TABLE 56
DAILY FLIGHTS IN AND OUT OF CALIFORNIA CITIES BY AVIATION AREAS

Area	City Served	Served by		Total	Existing Airport Class
		Mainline	Feederline	In and Out	
California				906	
Area 1.	San Diego	Western, United, American		50	8
Area 2.	Burbank	Western, United		48	5
	Long Beach	Western, United		24	6
	Los Angeles	Western, United, Pan-American, American, TWA, Pacific (NC)	Southwest	234	4
				306	
Area 3.	El Centro	Western		4	6
	Palm Springs	Western		6	6
				10	
Area 4.	Bakersfield	United		14	5
Area 5.	Monterey	United	Southwest	12	4
	Oxnard-Ventura		Southwest	8	4
	Salinas	United		6	4
	San Luis Obispo		Southwest	8	3
	Santa Barbara	United	Southwest	16	4
	Santa Cruz-Watsonville		Southwest	8	4
	Santa Maria		Southwest	8	4
				66	
Area 6.	Coalinga		Southwest	8	*S-2
	Fresno	TWA, United		28	3 (6)
	Visalia	United		4	5
				40	
Area 8.	Merced	United		2	†3
	Modesto	United		6	†3
	Stockton	United		2	4
				10	
Area 9.	Oakland	Western, United, TWA	Southwest	94	5
	San Francisco	Pan-American, TWA, Western, United, Pacific (NC)	Southwest	170	7
	San Jose		Southwest	8	*S-2
	Santa Rosa		Southwest	8	6
	Vallejo		Southwest	8	4
				288	
Area 10.	Marysville		Southwest	8	5
	Sacramento	United, Pacific (NC)	Southwest	42	5
				50	
Area 11.	Eureka	United	Southwest	12	5
	Fort Bragg		Southwest	8	4
	Ukiah		Southwest	8	3
				28	
Area 12.	Chico		Southwest	8	6
	Red Bluff	United	Southwest	12	†3
				20	
Area 14.	Dunsmuir		Southwest	8	*1
	Redding		Southwest	8	5
	Yreka		Southwest	8	6
				24	

NC—Noncertificated.

* Inadequate for feeder service.

† Mainline service should have Class 4 or larger airport.

It is significant to note at this point, however, by reference to Table 56, that airport facilities at mainline air carrier stops are of Class 4 or larger at all except three points and that all except three feederline stops are of the minimum Class 3 or larger airports. The three feederline airports requiring immediate improvement to Class 3 are Coalinga, San Jose and Dunsmuir; while mainline airports at Merced, Modesto, and Red Bluff require early expansion to Class 4 facilities.

The daily flights available between the cities of California now enjoying air carrier service are indicated by Figure 6 and total 327 daily intra-State schedules. A similar indication of daily flights available to points of first landing in interstate air transport is provided in Figure 7 showing a total of 168 daily flights in and out of the State to other states and 9 daily international in and out flights.

AIRLINE SERVICE IN CALIFORNIA
FLIGHTS PER DAY
DECEMBER 1946

OUTBOUND	INBOUND																																				
	LOS ANGELES	SAN FRANCISCO	OAKLAND	SAN DIEGO	BURBANK	SACRAMENTO	FRESNO	LONG BEACH	SANTA BARBARA	BAKERSFIELD	MONTEREY	EUREKA	RED BLUFF	CHICO	MARYSVILLE	YREKA	DUNSMUIR	REDDING	FORT BRAGG	UKIAH	SANTA ROSA	SAN JOSE	SANTACRUZ	COALINGA	SAN LUIS OBISPO	SANTA MARIA	OXNARD	VALLEJO	MODESTO	SALINAS	PALM SPRINGS	VISALIA	EL CENTRO	MERCED	STOCKTON		
LOS ANGELES		27	4	12	3		3	5	1	3																		2				1	1				
SAN FRANCISCO	23		25		6	6	2				1		1									2	2							2							
OAKLAND	2	21			2	3	2					1	1																2								
SAN DIEGO	10							7																										1			
BURBANK	3	5	1			2			1	1																							1				
SACRAMENTO	2	3	4				1								2														2		1						
FRESNO	3	3	3							3																					1						
LONG BEACH	7	1		5																																	
SANTA BARBARA	2										1																2	2				1					
BAKERSFIELD	1				2		4																														
MONTEREY		1							1															2	2												
EUREKA			1																	2																	
RED BLUFF		1												2					2																		
CHICO													2		2																						
MARYSVILLE						2								2																							
YREKA																	2																				
DUNSMUIR																	2		2																		
REDDING													2				2																				
FORT BRAGG												2									2																
UKIAH																				2		2															
SANTA ROSA		2																			2																
SAN JOSE		2																						2													
SANTA CRUZ											2												2														
COALINGA											2															2											
SAN LUIS OBISPO																									2		2										
SANTA MARIA									2																	2											
OXNARD	2								2																												
VALLEJO			2			2																															
MODESTO		1					1																									1					
SALINAS		1							1																												
PALM SPRINGS	1				1																																
VISALIA	1																																				1
EL CENTRO				1																													1				
MERCED																																					
STOCKTON		1																																			1

FIGURE 6

TABLE 57
GROWTH OF SCHEDULED AIR TRANSPORT IN CALIFORNIA—1939 TO 1946

	1939	1945	Ratio 1945 to 1939	1946	Ratio 1946 to 1939
Passengers—On and Off					
Los Angeles	124,736	761,452	6.10	1,370,080	10.98
San Francisco	64,176	442,968	6.90	834,360	13.00
San Diego	20,000	113,641	5.68	155,959	7.80
Oakland	25,263	49,087	1.94	90,804	3.59
Fresno	3,613	14,129	3.91	23,256	6.44
Sacramento	5,700	19,800	3.47	56,738	9.95
Monterey (Del Monte)	1,000	3,938	3.94	6,268	6.27
Bakersfield	1,635	3,018	1.85	12,927	7.91
Santa Barbara	1,800	*4,000	2.22	7,035	3.91
Long Beach	1,234	21,216	17.19	25,453	20.62
Other Stations		*4,500		*10,965	
California Total	249,157	1,437,749	5.77	2,593,845	10.41
Air Mail—Pounds Dispatched					
Los Angeles	1,759,854	9,680,192	5.50	*6,000,000	3.40
San Francisco	645,739	17,851,306	27.64	6,418,981	9.94
San Diego	85,856	876,384	10.21	587,938	6.85
Oakland	211,561	848,180	4.01	620,507	2.93
Fresno	46,589	154,969	3.33	410,745	8.82
Sacramento	58,645			149,488	2.55
Monterey (Del Monte)	6,299	53,695	8.52	25,610	4.07
Bakersfield	23,133			36,885	1.59
Santa Barbara	7,242			12,904	1.78
Long Beach	25,091	258,941	10.32	120,550	4.80
Red Bluff				11,176	
Merced				†4,400	
Modesto				†6,055	
Stockton				†6,625	
Salinas				†10,718	
California Total	2,873,012	Incomplete		14,422,592	5.02

* Estimated from partial reports available.

† Estimated from reports for partial year's operation.

Source: 1939—From tabulation in files of California State Planning Board.
1945-46—From data obtained from airports and airlines.

The growth of scheduled air transport in California from 1939 through 1946 (Table 57) shows 10.4 times the passenger volume in 1946 as in 1939 with the impressive total of 2,593,845 domestic passengers on and off at California's major stations only, a figure representing 10.78 percent of the total domestic passengers carried in the United States. California stations have provided an increasingly greater percentage to total air traffic throughout the history of civil aviation. Air mail dispatched from all California cities during 1946 totaled 14,422,592 pounds—a fivefold increase over the 1939 total. Additional comparative figures between California and the United States are shown in Table 67 upon which the projections found in Part V are based.

Table 58 shows the rank of California stations in comparison with the ten leading stations of the United States and with other western cities, first upon the basis of passengers generated and secondly, upon the basis of revenue passenger miles generated. Although the figures shown cover the month of September, 1940, they illustrate the high standing of California cities in both respects and also their relationship to each other. During this one month study California developed 2.5 passengers per thousand population against a national

average of 1.6 per thousand and 4.8 pounds of air mail per thousand population as compared with a national average of 1.45 pounds.

In a similar study made by the U. S. Civil Aeronautics Board in September, 1944, Los Angeles ranked third of all U. S. cities with 913 passengers generated per day and San Francisco fifth with 750 passengers generated per day. In the same study the Los Angeles-San Francisco route ranked fourth in the United States of all inter-city routes with 258 passengers per day, equivalent to a full load on the most modern streamline train. More recent estimates indicate that the daily air traffic between California's two principal cities approximated 750 passengers per day during 1946.

Los Angeles generated an average of 2,150 passengers per day to all points during 1946 while San Francisco produced 1,143 out-bound passengers per average day.

In summation it may be stated that California's present pattern of Main Line scheduled air transport well serves the needs of the State; that it is growing at a greater rate than the national figure; and that its growth will continue at an accelerated pace as California fulfills its destiny as the first State in the Nation

C A L I F O R N I A																													
NATIONAL AND INTERNATIONAL AIRLINE SERVICE																													
FLIGHTS PER DAY																													
DECEMBER 1946																													
TO OR FROM WITHOUT STOPS CALIFORNIA STATIONS				SEATTLE	PORTLAND	EUGENE	MEDFORD	KLAMATH FALLS	RENO	ELKO	OGDEN	SALT LAKE	CEDAR CITY	BOULDER CITY	DENVER	KANSAS CITY	NEW YORK	OMAHA	CHEYENNE	ALBUQUERQUE	TULSA	DALLAS	EL PASO	OKLAHOMA CITY	PHOENIX	TUSCON	MEXICALI	MEXICO CITY	HONOLULU
				IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT	IN OUT
LOS ANGELES		IN OUT		1 1									1 1	2 2	2 2	1 1				4 8	1 1	1 1	1 1		25 18	1 5	1 1	1 1	1 1
SAN FRANCISCO		IN OUT	1 1	5 5	1 1		2 2		3 2	1 1				1 2	2 2			1 1	1 1										15 15
OAKLAND		IN OUT		2 1		1 1	1 1		2 3			1 1			2 2														
SAN DIEGO		IN OUT																						1 1	3 5	3 1			
SACRAMENTO		IN OUT					1 1	1 1	3 4	1 1																			
BURBANK		IN OUT											1 1		1 1														
EUREKA		IN OUT					3 2																						
YREKA		IN OUT					2 2																						
RED BLUFF		IN OUT						1 1																					

FIGURE 7

TABLE 58
AIRLINE PASSENGER TRAFFIC GENERATED
RANK OF CALIFORNIA TERMINALS IN NATION
SEPTEMBER, 1940

City	Traffic Generated		Rank in United States	
	Passengers	Passenger Miles	By Passengers	By Passenger-Miles
New York.....	76,784	38,125,460	1	1
Chicago.....	37,382	20,069,265	2	2
Washington.....	26,300	10,263,390	3	4
Detroit.....	22,979	7,596,404	4	6
Boston.....	22,231	669,253	5	7
Los Angeles.....	15,060	13,784,980	6	3
Cleveland.....	13,583	4,182,018	7	9
San Francisco.....	12,013	9,292,631	8	5
Pittsburgh.....	9,498	3,197,686	9	13
Philadelphia.....	8,429	3,138,024	10	15
St. Louis.....	7,309	3,652,270	11	10
Seattle.....	6,470	4,318,099	14	8
Portland.....	4,882	2,410,223	19	17
San Diego.....	2,177	928,847	38	35
Salt Lake City.....	2,007	1,311,526	39	26
Oakland.....	1,097	782,084	54	41
Reno.....	957	376,286	59	67
Fresno.....	895	261,923	64	75
Sacramento.....	688	281,880	76	73
Del Monte.....	492	151,643	92	100
Bakersfield.....	307	79,090	111	129
Santa Barbara.....	281	137,292	117	107
Red Bluff.....	57	20,837	177	179

Source: Origin and Destination Airline Traffic Survey—Civil Aeronautics Board, September, 1940.

and as the gateway to vast development in the Pacific Basin. Even as this is written, extensions to existing routes have added San Francisco as a new Western terminal for American Airlines and provided additional coastwise service by the extension of Western Airlines Los Angeles-San Francisco route to Seattle.

Feeder Lines

California's one certificated feeder airline is scarcely six months old but has already proven its worth to the cities served along its 1,150 miles of certificated route. Southwest Airways Company, operator of Route 76, established itself during the war as a Contract Primary Flight School and also as the operator of a limited Army Cargo Transport Service serving California and Arizona Army Air Fields. Upon the basis of this experience the company was granted the feeder route connecting California's Coastal cities with Medford, Oregon and its Sacramento Valley cities with San Francisco. Operating Douglas DC-3 equipment under "contact" conditions only, without benefit of radio range stations at most of the points served, the company's operations to date have been successful beyond expectation. Load factors have approximated 50 percent even though the equipment utilized was larger than originally considered necessary. The most productive portions of the route have proven to be in the isolated northwestern coastal region not previously enjoying air transport

service. Contrary to expectations the route has proven to be less of a "feeder" line and more of a point-to-point transportation service. To date, approximately 12 percent of the passengers have been fed into connecting main line routes.

The company has recently made application to the Civil Aeronautics Board for modifications to its route certificate which will permit it to serve Paso Robles, King City, Salinas and Crescent City on its coast route and Oroville on its Sacramento Valley route. All of these cities have adequate airport facilities available. Additional routes are sought which will provide feeder service to the following cities not now benefiting:

(a) Los Angeles, Long Beach, Fullerton, Santa Ana, Laguna Beach, Oceanside, Del Mar to San Diego.

(b) Los Angeles via Ontario, Riverside, Palm Springs, Indio, Brawley, El Centro, Calexico with Yuma, Arizona.

(c) Los Angeles via Taft, Bakersfield, Delano, Tulare and Hanford with Coalinga.

(d) Coalinga via Fresno, Madera, Merced, Modesto and Stockton with San Francisco and Sacramento.

(e) Los Angeles via Palmdale, Mojave, Trona, Death Valley (seasonal), Independence, Bishop, Minden (Nev.), Carson City (Nev.) with Reno, Nev.

(f) Reno, Nev. via Portola, Susanville, Alturas with Klamath Falls, Oregon and Medford, Oregon.

(g) Eureka via Redding, Susanville and Portola, California with Reno, Nevada.

The last route mentioned above is one which would greatly augment the air service pattern of California by providing rapid service over an area having very poor surface travel accommodations. It would provide real feeder service for main line connections to and from the east.

The proposed route along California's eastern border has been the basis for previous route application. It has been operated for brief periods over the past twenty years by uncertificated carriers. It represents a vast recreational area of California now devoid of air-line service. With present day expanding air travel potential and serious attention to traffic development, this route offers more possibility of success than those already established which parallel existing airlines.

The routes proposed above would complete a pattern of main and feeder airlines in California which would place air transportation and air mail service directly at the disposal of 99 percent of the population of the State. Suitable consideration has been given to the airport requirements of the proposed system in the Area treatments of this report. Actually five of the cities proposed in the application lack suitable facilities; eight have marginal Class 2 airports; all others have adequate airports for the proposed services.

4. NON-SCHEDULED AVIATION

Analysis of Aircraft Ownership

The rapid expansion of non-scheduled aviation in the first postwar years of 1946 exceeded the most optimistic forecast. The sale of some 18,000 surplus military training aircraft to former service pilots, plus the production and sale of almost 35,000 new civil aircraft during the year, resulted in a national increase in aircraft registrations from 37,789 on January 1st, to an estimated 85,000 at the close of the year. No actual count of aircraft registered in California was available for a comparable January 1st date, due chiefly to the displacement of California civilian aircraft during the war, as indicated by the July, 1945 total of 1,589 registrations in California shown in the Civil Aeronautics Administration Statistical Handbook. At midyear the same authority placed the California total at 6,539, and on October 15, 1946 the total was estimated at 7,200 by the Sixth Regional Office of the Civil Aeronautics Administration, at which time the registration records were admittedly five months in arrears. At the year's end California's total was estimated by CAA at 8,500, or 10 percent of the national total.

Several attempts were made to ascertain the number of aircraft permanently based at each airport

throughout the State, together with the residence address of each owner, for the purposes of this report. The twenty-five percent response to questionnaires lacked the necessary uniformity and completeness to enable an accurate appraisal of the local situation in each area of the State. Through the field offices of the Civil Aeronautics Administration an estimate of the number of aircraft based on each airport visited periodically by their inspectors was obtained as of October 15, 1946, and the results thereof are shown for the respective airports, on the accompanying Area Tabulations of Existing Airports. This list provided no basis for determining residence locale of owners, and could not be used to establish area ownership or density estimates or ratios.

Accordingly, a tabulation of all current aircraft registrations in California as of May 1, 1946 was obtained from official records of the Civil Aeronautics Administration. This list was broken down, for this study, by county, city or town of registered owner's address with the results shown in Table 59. This master list showed a total registration of 4,878 aircraft for the State as of May 1, 1946.

County totals were then placed in proper Area relationship to arrive at the tally shown in Column 1 of

CALIFORNIA AIRPORTS

TABLE 59
CALIFORNIA AIRCRAFT REGISTRATION BY COUNTIES AND CITIES FROM ADDRESSES
OF ALL OWNERS OF RECORD—MAY 1, 1946

County City	Num- ber	County City	Num- ber	County City	Num- ber
California.....	4,878	Glenn		Los Angeles	
		Orland.....	3	Alhambra.....	25
Alameda		Willows.....	16	Altadena.....	3
Alameda.....	12		19	Arcadia.....	11
Albany.....	2	Humboldt		Azusa.....	1
Berkeley.....	22	Eureka.....	7	Baldwin Park.....	10
Hayward.....	5	Fortuna.....	1	Bel Air.....	1
Livermore.....	1	Hydesville.....	1	Bell.....	9
Oakland.....	87	Scotia.....	2	Bellflower.....	22
Piedmont.....	4		11	Bell Gardens.....	2
San Leandro.....	4	Imperial		Beverly Hills.....	23
San Lorenzo.....	2	Brawley.....	22	Burbank.....	122
Warm Springs.....	1	Callexico.....	4	Canoga Park.....	4
	140	Calipatria.....	7	Claremont.....	2
Amador		El Centro.....	7	Clearwater.....	3
Jackson.....	1	Imperial.....	11	Compton.....	66
			51	Culver City.....	22
Butte		Inyo		Dominguez.....	1
Chico.....	20	Big Pine.....	1	Downey.....	15
Durham.....	2	Bishop.....	9	El Monte.....	14
Gridley.....	7	Independence.....	9	El Segundo.....	6
Palermo.....	2	Lone Pine.....	4	Encino.....	3
Paradise.....	3	Olancho.....	4	Gardena.....	15
	34		27	Glendale.....	118
Calaveras		Kern		Hawthorne.....	43
Mokelumne Hill.....	1	Bakersfield.....	50	Hermosa Beach.....	9
Valley Springs.....	2	Delano.....	8	Hollywood.....	80
West Point.....	1	Famoso.....	1	Hollydale.....	4
	4	Inyokern.....	2	Huntington Park.....	22
Colusa		Johannesburg.....	1	Hynes.....	2
Arbuckle.....	4	Minter Field.....	1	Inglewood.....	42
Colusa.....	7	Mojave.....	3	La Canada.....	4
Grimes.....	3	Oildale.....	3	La Crescenta.....	3
Williams.....	8	Shafter.....	3	Lancaster.....	13
	22	Taft.....	18	Lawndale.....	2
Contra Costa		Tehachapi.....	1	Lennox.....	1
Concord.....	31	Wasco.....	1	Lomita.....	6
Crockett.....	1		92	Long Beach.....	203
Lafayette.....	1	Kings		Los Angeles.....	833
Pittsburg.....	1	Avenal.....	2	Lynwood.....	7
Richmond.....	12	Corcoran.....	6	Magnolia Park.....	2
Rodeo.....	1	Hanford.....	12	Manhattan Beach.....	17
Walnut Creek.....	1	Lemoore.....	2	Maywood.....	5
	48	Stratford.....	3	Monrovia.....	15
El Dorado			25	Montebello.....	12
Placerville.....	3	Lake		Monterey Park.....	1
		Lakeport.....	2	North Hollywood.....	71
Fresno		Middletown.....	1	Norwalk.....	1
Coalinga.....	1		3	Pacific Palisades.....	2
Fresno.....	108	Lassen		Pacoima.....	5
Kerman.....	3	Bieber.....	1	Palmdale.....	1
Parlier.....	2	Doyle.....	1	Palos Verdes Est.....	1
Reedley.....	9	Herlong.....	2	Pasadena.....	58
Sanger.....	1	Susanville.....	7	Pico.....	4
San Joaquin.....	1	Westwood.....	1	Pomona.....	9
Selma.....	6		12	Puente.....	18
	131			Redondo Beach.....	2
				Reseda.....	3
				Rivera.....	1
				Rosemead.....	14
				Roscoe.....	6
				San Dimas.....	3
				San Fernando.....	27
				San Gabriel.....	15
				San Marino.....	2
				San Pedro.....	4
				Santa Monica.....	39
				Saugus.....	2
				Sherman Oaks.....	9
				Sierra Madre.....	2

TABLE 59—Continued
 CALIFORNIA AIRCRAFT REGISTRATION BY COUNTIES AND CITIES FROM ADDRESSES
 OF ALL OWNERS OF RECORD—MAY 1, 1946

County City	Num- ber	County City	Num- ber	County City	Num- ber
Los Angeles—Continued		Napa		Riverside—Area 3	
South Gate.....	12	Napa.....	3	Banning.....	5
Tarzana.....	4	Pope Valley.....	1	Blythe.....	15
Tujunga.....	1	Rutherford.....	1	Indio.....	8
Torrance.....	4			Mecca.....	1
Van Nuys.....	66		5	Thermal.....	1
Venice.....	16				30
West Covina.....	1	Nevada		Sacramento	
West Los Angeles.....	5	Grass Valley.....	1	Antelope.....	2
Whittier.....	12	Nevada City.....	5	Del Paso Heights.....	3
Willowbrook.....	2		6	Fair Oaks.....	2
Wilmar.....	2			Folsom.....	1
Wilmington.....	6			Herald.....	1
	2,254	Orange		Isleton.....	1
Madera		Anaheim.....	4	Rio Linda.....	3
Madera.....	6	Balboa Island.....	9	Sacramento.....	121
		Brea.....	1	Walnut Grove.....	1
Marin		Buena Park.....	3		135
Black Point.....	1	Costa Mesa.....	8	San Benito	
Corte Madera.....	1	Dana.....	1	Paicines.....	1
Grand View.....	1	Fullerton.....	43		
Mill Valley.....	1	Garden Grove.....	1	San Bernardino—Area 2	
San Anselmo.....	1	Laguna Beach.....	2	Big Bear.....	3
San Rafael.....	1	La Habra.....	5	Bloomington.....	1
Santa Venetia.....	1	Midway City.....	1	Chino.....	4
Sausalito.....	1	Newport Beach.....	1	Colton.....	11
	8	Olive.....	2	Etiwanda.....	1
Mariposa		Orange.....	4	Highland.....	2
Yosemite Nat'l Park.....	2	Placentia.....	1	Ontario.....	26
		San Clemente.....	1	Redlands.....	4
Mendocino		Santa Ana.....	38	Rialto.....	4
Ft. Bragg.....	1	Seal Beach.....	2	San Bernardino.....	62
Ukiah.....	2	Yorba Linda.....	1	Upland.....	3
Willits.....	3		128	Yucaipa.....	2
	6	Placer			123
Merced		Auburn.....	18	San Bernardino—Area 3	
Dos Palos.....	16	Bowman.....	1	Baker.....	1
El Nido.....	8	Rocklin.....	1	Barstow.....	1
Hilmar.....	1	Roseville.....	1	Daggett.....	3
Livingston.....	1		21	Needles.....	4
Los Banos.....	4	Plumas		Trona.....	2
Merced.....	13	Beckwourth.....	12	Twenty-nine Palms.....	1
Planada.....	1	Greenville.....	1	Victorville.....	2
	44	Portola.....	4		14
Modoc		Quincy.....	9	San Diego	
Alturas.....	11	Sloat.....	1	Bostonia.....	1
Canby.....	3		27	Carlsbad.....	2
	14	Riverside—Area 2		Chula Vista.....	10
Monterey		Beaumont.....	1	Coronado.....	8
Carmel.....	6	Calimesa.....	1	El Cajon.....	3
King City.....	5	Corona.....	6	Escondido.....	9
Monterey.....	6	Hemet.....	12	Imperial Beach.....	1
Pacific Grove.....	1	Lakeview.....	1	La Jolla.....	15
Pebble Beach.....	3	Moreno.....	2	Lakeside.....	12
Salinas.....	39	Norco.....	1	La Mesa.....	17
San Ardo.....	1	Nuevo.....	1	Lemongrove.....	1
Seaside.....	1	Perris.....	2	Mission Beach.....	5
	62	Riverside.....	54	National City.....	14
		Romoland.....	2	Ocean Beach.....	1
		San Jacinto.....	12	Oceanside.....	1
			95	Palm City.....	1
				Ramona.....	2

CALIFORNIA AIRPORTS

TABLE 59—Continued
CALIFORNIA AIRCRAFT REGISTRATION BY COUNTIES AND CITIES FROM ADDRESSES
OF ALL OWNERS OF RECORD—MAY 1, 1946

County City	Num- ber	County City	Num- ber	County City	Num- ber
San Diego—Continued		Santa Clara—Continued		Sutter	
San Diego.....	249	San Jose.....	57	Live Oak.....	5
San Ysidro.....	1	Santa Clara.....	3	Yuba City.....	14
Spring Valley.....	1	Saratoga.....	1		19
Sunnyside.....	1	Sunnyvale.....	4		
	355		113	Tehama	
San Francisco		Santa Cruz		Corning.....	14
San Francisco.....	111	Aptos.....	4	Red Bluff.....	11
		Santa Cruz.....	6		25
San Joaquin		Watsonville.....	2	Trinity	
Acampo.....	1		12	Minersville.....	1
Farmington.....	1			Weaverville.....	1
Linden.....	1	Shasta			2
Lodi.....	8	Fall River Mills.....	10		
Manteca.....	1	Redding.....	5		
Stockton.....	24		15	Tulare	
Tracy.....	3			Dinuba.....	4
	39			Porterville.....	3
San Luis Obispo		Siskiyou		Richgrove.....	1
Atascadero.....	3	Dorris.....	1	Springville.....	1
Paso Robles.....	10	Gazelle.....	1	Tipton.....	2
San Luis Obispo.....	12	Montague.....	1	Tulare.....	70
San Simeon.....	1	Weed.....	1	Visalia.....	29
	26	Yreka.....	6	Woodlake.....	1
			10		111
San Mateo		Solano		Tuolumne	
Atherton.....	2	Benicia.....	1	Columbia.....	1
Belmont.....	12	Fairfield.....	12		
Burlingame.....	18	Rio Vista.....	4	Ventura	
Colma.....	1	Vacaville.....	1	Camarillo.....	3
Hillsborough.....	1	Vallejo.....	20	Fillmore.....	1
Lomita Park.....	3		38	Ojai.....	6
Menlo Park.....	10			Oxnard.....	34
Millbrae.....	1	Sonoma		Santa Paula.....	23
Redwood City.....	9	Healdsburg.....	8	Santa Susanna.....	3
San Bruno.....	8	Penngrove.....	1	Saticoy.....	1
San Carlos.....	18	Petaluma.....	3	Thousand Oaks.....	1
San Mateo.....	23	Santa Rosa.....	3	Ventura.....	11
Sharp Park.....	1	Sebastopol.....	1		83
South San Francisco.....	11	Sonoma.....	2		
	118		18	Yolo	
Santa Barbara				Capay.....	4
Lompoc.....	9	Stanislaus		Clarksburg.....	5
Santa Barbara.....	7	Crows Landing.....	5	Davis.....	7
Santa Maria.....	63	Denair.....	1	Winters.....	1
	79	Hughson.....	1	Woodland.....	19
Santa Clara		LaGrange.....	1		36
Campbell.....	1	Modesto.....	18		
Los Altos.....	2	Oakdale.....	1	Yuba	
Los Gatos.....	1	Patterson.....	7	Marysville.....	22
Mt. Hamilton.....	2	Turlock.....	6		
Mountain View.....	1	Westley.....	1		
Palo Alto.....	41		41	California Total.....	4,878

Table 60. A ratio of ownership to population for counties and Areas was then applied to the October 15 total of 7,200 aircraft for the State, producing the distribution shown in Column 3 of Table 60 and the ratio of

aircraft per 10,000 persons shown in Column 4 of Table 60 was thereby established to form the basis for Plate P showing the actual aircraft ownership density of each county in the State upon the basis of aircraft

registration per 10,000 persons. This Table, and the accompanying Plate P, therefore represent the best available indication of current ownership distribution. Relative density is proportional to the degree of shading and the pattern from that viewpoint justifies in general the earlier delineation of Areas for use throughout this study. Area density varies from 34.83 aircraft per 10,000 persons in Area 7 down to 2.86 in Area 11 against a State average of 7.71 and a national average of 5.11 per 10,000 population. All but three of California's Aviation Areas exceeded the national average and nine of the fourteen Areas exceeded the State average.

TABLE 60

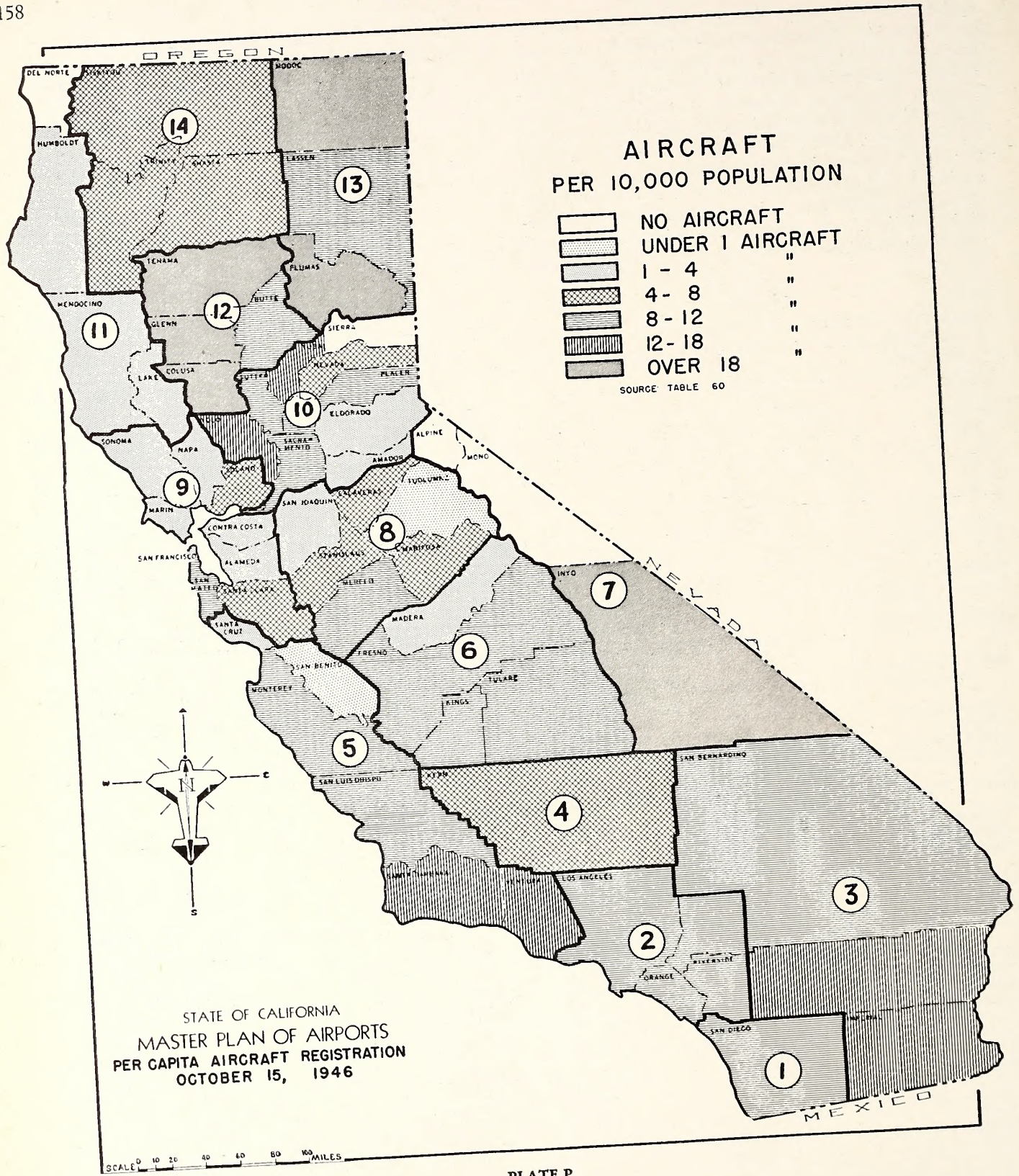
CALIFORNIA AIRCRAFT REGISTRATION BY AREAS AND COUNTIES—ESTIMATED PER CAPITA OWNERSHIP—OCTOBER 15, 1946

Area County	Tally of Registrations May 1, '46 Table 59	Population Estimates Table 63	Pro rata of State Aircraft Persons, Oct., '46	Air- planes per 10,000 Persons, Oct., '46
United States.....		141,000,000	71,982	5.11
California.....	4,878	9,335,000	7,200	7.71
Area 1. San Diego.....	355	470,500	524	* 11.14
Area 2. Los Angeles Metropolitan.....	2,600	4,089,535	3,838	9.38
Los Angeles.....	2,254	3,597,500	3,327	9.25
Orange.....	128	170,700	189	11.07
West Riverside.....	95	108,375	140	12.92
S.W. San Bernardino	123	212,960	182	8.55
Area 3. Desert.....	95	121,865	140	11.49
Imperial.....	51	56,700	75	13.23
Riverside.....	30	36,125	44	12.18
San Bernardino.....	14	29,040	21	7.23
Area 4. Kern.....	92	192,000	136	7.08
Area 5.....	263	400,650	388	9.68
Monterey.....	62	103,000	92	8.93
San Benito.....	1	14,450	1	.69
San Luis Obispo.....	26	47,000	38	8.09
Santa Barbara.....	79	87,700	117	13.34
Santa Cruz.....	12	58,000	18	3.10
Ventura.....	83	90,500	122	13.48
Area 6.....	273	459,400	403	8.77
Fresno.....	131	237,500	193	8.13
Kings.....	25	44,400	37	8.33
Madera.....	6	32,500	9	2.77
Tulare.....	111	145,000	164	11.31
Area 7.....	27	11,485	40	34.83
Alpine.....		285		
Inyo.....	27	9,800	40	40.82
Mono.....		1,400		

TABLE 60—Continued
CALIFORNIA AIRCRAFT REGISTRATION BY AREAS AND COUNTIES—ESTIMATED PER CAPITA OWNERSHIP—OCTOBER 15, 1946

Area County	Tally of Registrations May 1, '46 Table 59	Population Estimates Table 63	Pro rata of State Aircraft Oct., '46	Air- planes per 10,000 Persons, Oct., '46
Area 8.....	131	388,900	193	4.96
Calaveras.....	4	9,450	6	6.35
Mariposa.....	2	4,300	3	6.98
Merced.....	44	55,550	65	11.70
San Joaquin.....	39	192,000	58	3.02
Stanislaus.....	41	116,650	60	5.14
Tuolumne.....	1	10,950	1	.91
Area 9. San Francisco Metropolitan.....	599	2,515,150	884	3.51
Alameda.....	140	721,500	207	2.87
Contra Costa.....	48	278,500	71	2.55
Marin.....	8	75,600	12	1.59
Napa.....	5	42,700	7	1.64
San Francisco.....	111	775,000	164	2.12
San Mateo.....	118	179,000	174	9.72
Santa Clara.....	113	236,000	167	7.08
Solano.....	38	119,750	56	4.68
Sonoma.....	18	87,100	26	2.99
Area 10.....	243	386,140	359	9.30
Amador.....	1	8,200	1	1.22
El Dorado.....	3	14,850	5	3.37
Nevada.....	6	19,400	9	4.64
Placer.....	21	33,250	31	9.32
Sacramento.....	135	224,000	199	8.88
Sierra.....		2,490		
Sutter.....	19	24,900	28	11.24
Yolo.....	36	34,300	53	15.45
Yuba.....	22	24,750	33	13.33
Area 11.....	20	101,250	29	2.86
Del Norte.....		5,100		
Humboldt.....	11	51,950	16	3.08
Lake.....	3	10,750	4	3.72
Mendocino.....	6	33,450	9	2.69
Area 12.....	100	95,050	148	15.57
Butte.....	34	53,100	50	9.42
Colusa.....	22	10,000	33	33.00
Glenn.....	19	15,350	28	18.24
Tehama.....	25	16,600	37	22.29
Area 13.....	53	40,150	78	19.43
Lassen.....	12	19,000	18	9.47
Modoc.....	14	9,650	20	20.73
Plumas.....	27	11,500	40	34.78
Area 14.....	27	62,925	40	6.36
Shasta.....	15	29,450	22	7.47
Siskiyou.....	10	29,400	15	5.10
Trinity.....	2	4,075	3	7.36

* Data in this column is basis of Plate P, showing aircraft density by counties.



Outstanding counties in aircraft ownership with respect to population were San Diego, Imperial, Riverside, San Bernardino, Ventura, Santa Barbara, Tulare, Inyo, San Joaquin, Sutter, Yolo, Yuba, Colusa, Glenn, Tehama, Plumas, and Modoc.

While the prorated distribution shown in Table 60 was deemed adequate for the purpose of showing the latest status, it was considered advisable to return to the original tally of actual registrations for the computation of the Aircraft Ownership Index derived in Table 61. Here the May 1 registration (Column 1) was divided by the July 1, 1946 estimated population (Column 2) in units of 10,000 for the ratio shown in Column 3. In each case these ratios were compared with the State average of 5.225 aircraft per 10,000 population for the Ownership Index shown in Column 4 which, in turn, is used in Column 1 of Table 73, Part V, for the projection of potential aircraft ownership and distribution for the years 1950 and 1955, by the method explained therein.

TABLE 61

CALIFORNIA AIRCRAFT REGISTRATION BY AREAS AND COUNTIES—PER CAPITA OWNERSHIP AND OWNERSHIP INDEX—MAY 1, 1946

Area County	Tally of Ownership Registrations, May 1, 1946	Population Estimates July 1, 1946	Airplanes per 10,000 Persons May 1, 1946	Owner- ship Index Percent of State Average
Column	1	2	3	4
United States.....	448,000	141,000,000	3.404	-----
California.....	4,878	9,335,000	5.225	100
Area 1. San Diego....	355	470,500	7.545	144
Area 2. Los Angeles Metropolitan.....	2,600	4,089,535	6.357	122
Los Angeles.....	2,254	3,597,500	6.265	120
Orange.....	128	170,700	7.499	143
West Riverside.....	95	108,375	8.766	167
S.W. San Bernardino	123	212,960	5.776	110
Area 3. Desert.....	95	121,865	7.796	150
Imperial.....	51	56,700	8.995	172
Riverside.....	30	36,125	8.304	159
San Bernardino.....	14	29,040	4.821	93
Area 4. Kern.....	92	192,000	4.792	92
Area 5.....	263	400,650	6.564	126
Monterey.....	62	103,000	6.019	115
San Benito.....	1	14,450	.692	13
San Luis Obispo.....	26	47,000	5.532	106
Santa Barbara.....	79	87,700	9.008	172
Santa Cruz.....	12	58,000	2.060	40
Ventura.....	83	90,500	9.171	176

TABLE 61—Continued
CALIFORNIA AIRCRAFT REGISTRATION BY AREAS AND COUNTIES—PER CAPITA OWNERSHIP AND OWNERSHIP INDEX—MAY 1, 1946

Area County	Tally of Ownership Registrations, May 1, 1946	Population Estimates July 1, 1946	Airplanes per 10,000 Persons May 1, 1946	Owner- ship Index Percent of State Average
Column	1	2	3	4
Area 6.....	273	459,400	5.943	114
Fresno.....	131	237,500	5.516	106
Kings.....	25	44,400	5.631	108
Madera.....	6	32,500	1.846	35
Tulare.....	111	145,000	7.655	147
Area 7.....	27	11,485	23.509	450
Alpine.....	-----	285	-----	-----
Inyo.....	27	9,800	27.551	527
Mono.....	-----	1,400	-----	-----
Area 8.....	131	388,900	3.368	64
Calaveras.....	4	9,450	4.233	81
Mariposa.....	2	4,300	4.651	89
Merced.....	44	55,500	7.921	152
San Joaquin.....	39	192,000	2.031	39
Stanislaus.....	41	116,650	3.515	67
Tuolumne.....	1	10,950	.913	17
Area 9. San Francisco Metropolitan.....	599	2,515,150	2.382	46
Alameda.....	140	721,500	1.940	37
Contra Costa.....	48	278,500	1.724	33
Marin.....	8	75,600	1.058	20
Napa.....	5	42,700	1.171	22
San Francisco.....	111	175,000	1.432	27
San Mateo.....	118	179,000	6.592	126
Santa Clara.....	113	236,000	4.788	92
Solano.....	38	119,750	3.173	61
Sonoma.....	18	87,100	2.067	40
Area 10.....	243	386,140	6.293	120
Amador.....	1	8,200	1.220	23
El Dorado.....	3	14,850	2.020	39
Nevada.....	6	19,400	3.093	59
Placer.....	21	33,250	6.316	121
Sacramento.....	135	224,000	6.027	115
Sierra.....	-----	2,490	-----	-----
Sutter.....	19	24,900	7.631	146
Yolo.....	36	34,300	10.496	200
Yuba.....	22	24,750	8.889	170
Area 11.....	20	101,250	1.975	38
Del Norte.....	-----	5,100	-----	-----
Humboldt.....	11	51,950	2.117	41
Lake.....	3	10,750	2.791	53
Mendocino.....	6	33,450	1.794	34
Area 12.....	100	95,050	10.520	201
Butte.....	34	53,100	6.403	123
Colusa.....	22	10,000	22.000	421
Glenn.....	19	15,350	12.378	237
Tehama.....	25	16,600	15.060	288

TABLE 61—Continued
CALIFORNIA AIRCRAFT REGISTRATION BY AREAS AND
COUNTIES—PER CAPITA OWNERSHIP AND OWNER-
SHIP INDEX—MAY 1, 1946

Area County	Tally of Ownership Registra- tions, May 1, 1946	Population Estimates July 1, 1946	Airplanes per 10,000 Persons May 1, 1946	Owner- ship Index Percent of State Average
Column	1	2	3	4
Area 13-----	53	40,150	13.200	253
Lassen-----	12	19,000	6.316	121
Modoc-----	14	9,650	14.507	278
Plumas-----	27	11,500	23.478	449
Area 14-----	27	62,925	4.291	82
Shasta-----	15	29,450	5.093	97
Siskiyou-----	10	29,400	3.401	65
Trinity-----	2	4,075	4.908	94

Source: ^a Tabulation of airplane registrations by cities and counties, May 1, 1946—Table 59.

^b United States Census Bureau Report, Series P-46 No. 7.

^c Midpoint of Taxpayers Association estimates of January 1, 1946, and January 1, 1947.

^d Estimated.

In ranking the several Areas with respect to aircraft ownership, the highest per capita ownership is considered most desirable; hence, the Areas are ranked in descending order in that respect only, as follows:

Owner rank	Area	Aircraft per 10,000 persons	Persons per Aircraft	Family	Families per aircraft
-	State Average	7.71	1,297	3.22	403
1	Area 7 -----	34.83	287	3.15	91
2	Area 13 -----	19.43	515	3.27	157
3	Area 12 -----	15.57	642	3.30	195
4	Area 3 -----	11.49	870	3.80	229
5	Area 1 -----	11.14	898	3.21	280
6	Area 5 -----	9.68	1,033	3.45	299
7	Area 2 -----	9.38	1,066	3.14	339
8	Area 10 -----	9.30	1,075	3.40	316
9	Area 6 -----	8.77	1,140	3.61	316
10	Area 4 -----	7.08	1,412	3.56	397
11	Area 14 -----	6.36	1,572	3.20	491
12	Area 8 -----	4.96	2,016	3.52	573
13	Area 9 -----	3.51	2,849	3.24	879
14	Area 11 -----	2.86	3,496	3.27	1,069

Relative standing of individual counties with respect to State average may be approximated by interpolation, if the county ownership ratio per 10,000 persons shown in Column 4 of Table 60 is inserted in its proper relationship in the above tabulation.

The extremely high per capita ownership indicated for Area 7 and Inyo County is believed to reflect wartime dislocation of aircraft registrations occasioned by the cessation of all non-scheduled flying within one hundred fifty miles of the Pacific Coast or west of the Sierra Nevada Mountains. All of the civilian operators in Los Angeles and the central valley moved their Civil

Pilot Training activities into Nevada, Owens Valley or Arizona, and aircraft registrations reflecting that temporary wartime change had not been corrected entirely as of May 1, 1946, although the aircraft had been returned to their former bases. Because of the small numbers involved, even a slight remaining dislocation in this respect would materially affect the Area 7 ratios. Comparison of the Area 7 total of aircraft on airports as of October 15, 1946, with registrations of a similar date, indicates that a reduction of 25 percent in actual local registrations might be in order, which would change the above figures to 26.12 aircraft per 10,000 persons. This would bring the Area more nearly into line, but would not alter its position. Actually, the per capita ownership of aircraft in Area 7 should be higher than other Areas of the State since it is a region of vast distances, relatively good airports and excellent flying weather, where private ownership of aircraft can really pay dividends in convenience and time saving.

Throughout this study efforts were made to correlate aircraft ownership with population density, or to establish a numerical relationship which would uniformly indicate probable ownership under any given set of conditions. The sampling of the 58 counties in California appeared to be large enough for logical deductions of this nature. However, the vast geographical, commercial and climatic differences in the various Areas preclude the establishment of any basis for such a formula. The following tabulation indicates the results of such a numerical comparison:

Area	Aircraft Per 10,000 Persons	Persons Per Sq. Mi.	Sq. Mi. Per 10,000 Persons	Square Root of Pop. Density
State -----	7.71	59.5	16.8	4.10*
7 -----	34.83	.8	12,500.0	111.8
13 -----	19.43	3.6	2,777.7	52.73
12 -----	15.57	13.4	74.6	8.63
3 -----	11.49	4.2	2,380.9	48.79
1 -----	11.14	110.5	9.0	3.0 *
5 -----	9.68	30.6	32.7	5.72*
2 -----	9.38	573.2	.2	.045
10 -----	9.30	43.1	23.2	4.82*
6 -----	8.77	32.0	31.3	5.59*
4 -----	7.08	23.5	42.6	6.53*
14 -----	6.36	4.7	2,127.6	46.15
8 -----	4.96	40.3	24.8	4.98*
9 -----	3.51	359.9	.3	.055
11 -----	2.86	10.8	92.6	9.62*

Areas marked by asterisk (*) in the foregoing tabulation comprise the more uniformly populated, relatively similar areas of the State, and in these areas was found the only possible basis for a general statement regarding aircraft ownership. Considering Areas 1, 4, 5, 6, 8, 10 and 11 only, together with the State average, it may be suggested that aircraft ownership per 10,000 persons is roughly in inverse proportion to the square root of the population density in units per 10,000 persons. Such a statement will only hold in a broad area having similar general conditions and is not applicable to high concentrations of population,

TABLE 62
CALIFORNIA POPULATION AND AIRCRAFT REGISTRATION—RATIO OF RURAL
TO URBAN PER CAPITA OWNERSHIP—BY AVIATION AREAS—MAY, 1946

Area Number and Name	Population, 1940 Census		Registrations, May 1, 1946		Ratios of Registrations to Populations		Ratio Rural to Urban
	Percent Urban and Rural Non-farm	Percent Rural	Percent Urban and Rural Non-farm	Percent Rural	Urban Including Rural Non-farm	Rural Farm	
Column	1	2	3	4	5	6	7
California-----	90.8	9.2	79	21	.870	2.283	2.624
1. San Diego Metropolitan-----	92.8	7.2	87	13	.938	1.806	1.925
2. Los Angeles Metropolitan-----	97.8	2.2	81	19	.828	8.636	10.430
3. Desert-----	69.5	30.5	44	56	.633	1.836	2.900
4. Kern County-----	83.8	16.2	83	17	.990	1.049	1.060
5. Mid Coastal-----	80.7	19.3	87	13	1.078	.674	.625
6. Fresno Metropolitan-----	63.6	36.4	91	9	1.431	.247	.173
7. Inyo-Mono-----	89.4	10.6	†	†	†	†	†
8. Stockton Metropolitan-----	68.1	31.9	56	44	.822	1.379	1.678
9. San Francisco Bay-----	94.5	5.5	85	15	.899	2.727	3.033
10. Sacramento Metropolitan-----	82.3	17.7	82	18	.996	1.017	1.021
11. Redwood Empire-----	75.6	24.4	50	50	.661	2.049	3.100
12. Chico-Red Bluff-----	65.8	34.2	31	69	.471	2.018	4.285
13. Modoc Plateau-----	83.1	16.9	†	†	†	†	†
14. Shasta Cascade-----	80.8	19.2	†	†	†	†	†

† Registration insufficient to provide reliable basis.

Source: Registrations—From analysis of Table 59. Urban and rural non-farm combined.
Populations—From Table 37.

nor in the other extreme of sparse density, as is illustrated by the tabulation. It is included here as an interesting observation, and forms no basis for the projections which follow later in this report.

Table 62 presents the relationship between urban and rural population, and urban and rural aircraft registrations in the several Aviation Areas of the State, and of the State at large. While the breakdown of population by percentage is based upon the 1940 Census, it is considered reasonably accurate for 1946, since this relationship has been changing very gradually in California in recent decades. For the purpose of this comparison, "urban" includes suburban or "rural non-farm" population, while "rural" includes "rural-farm" population only, in order to more closely compare with the basis upon which aircraft registrations were classified.

Columns 3 and 4 of Table 62, giving the ratios of aircraft registration to population in each grouping are, in effect, a measure of per capita ownership in each group, for which reason Column 7, showing the ratio of Column 6 to Column 5 actually shows the relationship between rural per capita ownership and urban per capita ownership of aircraft in the several areas. While generally in conformity with criteria on the subject found in other surveys, certain outstanding points are worthy of mention.

In those Areas of high population density, or where the population is concentrated in a relatively small area,

with the remainder uninhabited desert or mountains, the ratio of rural to urban ownership is above the State average, as in Areas 2, 3, 9, 11 and 12. In Areas 1, 2 and 9 this ratio is in direct proportion to the population density, while in Areas 3, 11 and 12, typical of the low average density and high concentration group, it bears no relationship to the population density.

Areas 7, 13 and 14 are omitted from this study due to insufficient registration of aircraft ownership to afford a reliable basis for conclusions.

Area 6 presents the exceptional case where rural ownership of aircraft is far below that of urban dwellers. This apparent discrepancy is probably due to the large number of small cities in the Area, in which many of the actual ranch or rural owners reside, hence the unbalance of actual registrations.

In general it may be deduced from Table 62 that for the State at large the rural populace owns approximately three times as many aircraft per capita as their city neighbors, and the greater the concentration of population, the higher this ratio becomes. This latter deduction is in keeping with all studies on the subject which have been reviewed to date.

Present Field of Utility

Aircraft ownership in California reflects the many uses of aircraft in business, industry, commerce and personal pleasure, not found generally in any other

section of the country. There are more reasons for non-scheduled aviation to flourish than are commonly found in a similar area anywhere else in the United States.

California's two principal centers of population are separated by 327 miles, an overnight trip by rail, an easy two-hour flight. Several thousand people make the trip daily by motor car, train, established airline or personal aircraft, in connection with the many businesses which have common interests in both localities. A growing number find the personal or chartered airplane the convenient, time saving way of covering the State on business or for pleasure.

California's diversity of agriculture makes the use of aircraft for dusting, spraying and seeding more common than elsewhere in the United States, and several large firms of non-scheduled operators confine their activities wholly to this business. There are large acreages of cotton, vegetables, citrus and other fruits to be dusted or sprayed. There are vast acreages of rice to be seeded. All make for profitable aeronautical activity, increase production and decrease losses.

Many California industries have already found the use of cargo aircraft justifiable in the assembling of their raw material and the distribution of their finished products. Often weeks of delay are avoided in both respects. Distribution of the finished products of aircraft accessory manufacturers, the motion picture and garment industries, precision tool industry and many other specialty manufacturers is accelerated by both scheduled and non-scheduled aviation.

Vast forest areas are surveyed for timber estimates, mapped for timbering access roads, sprayed for pest control and protected from devastating fires by utilization of the airplane.

5. SUMMARY OF AERONAUTICAL APPRAISAL

The facts presented in the foregoing sections remain to be correlated and reviewed with respect to their relationship to each other, and to the State, with the object of determining qualitatively the relative standing of the several areas.

The following tabulation lists the Area percentages of State totals of Populations, Aircraft Registrations and Weighted Airport Values, and derives therefrom

Aerial mapping has made possible the completion and frequent revision of the grid of basic maps covering the 156,800 square miles of area within the State's borders.

The motion picture industry frequently employs non-scheduled aviation in film sequences, in access to "locations" and in transporting supplies and exposed film to and from distant points of activity.

The aeronautical education program in California's secondary school system is providing valuable flight indoctrination to high school students and aiding in sustaining a portion of the operating segment of non-scheduled aviation.

The State's wealth of scenic and recreational attractions invite the private aircraft owner on pleasant excursions afield, thus affording an incentive to private aircraft ownership beyond that found elsewhere.

The agriculturists are taking to the air in increasing numbers and are actively sponsoring private airports on western ranches. Supplies, replacement parts and medical aid are frequently rushed to remote areas by air, while residents of those areas enjoy all of the benefits of the metropolitan centers through the ease of access by aircraft. On the ranges the airplane aids at round-up time and throughout the season in the selection of good grazing land. Upon occasion, use of aircraft has been of material assistance in minimizing losses through cattle rustling.

Coastal fishing grounds are both protected and exploited by aerial reconnaissance. Geological, highway and reclamation surveys are expedited. The utility of the modern airplane daily is becoming recognized and extended. Its ultimate destiny is as broad as the imaginations of those who will to accept its benefits, and is contingent only upon adequate ground facilities.

ratios of each to the other, for the purpose of estimating the relative aeronautical standing of the fourteen Aviation Areas under consideration. It is pointed out that the values shown are percentages and ratios of percentages, for establishing values only, for which purpose they are equally as well suited as actual per capita figures :

Area Number	Area Values in Percent of State Totals			Ratio of Percentages of State Totals		
	Population July, 1946 (Table 63)	Aircraft Registered (Table 61)	Weighted Airports (Table 55)	Aircraft to Population	Airports to Population	Aircraft to Airports
1-----	5.04	7.28	5.43	1.44	1.08	1.34
2-----	43.81	53.30	16.89	1.22	.38	3.16
3-----	1.31	1.95	11.80	1.50	9.03	.17
4-----	2.06	1.87	7.54	.92	3.66	.25
5-----	4.29	5.39	8.56	1.26	2.00	.63
6-----	4.92	5.60	10.13	1.14	2.06	.55
7-----	.12	.55	3.09	4.50	25.05	.18
8-----	4.17	2.69	6.17	.64	1.48	.44
9-----	26.94	12.29	9.54	.46	.36	1.29
10-----	4.14	4.98	6.36	1.20	1.54	.78
11-----	1.08	.41	4.21	.38	3.88	.10
12-----	1.02	2.05	4.55	2.01	4.47	.45
13-----	.43	1.09	2.64	2.63	6.14	.41
14-----	.67	.55	3.09	.82	5.47	.18
State-----	100.00	100.00	100.00	1.00	1.00	1.00

The ratios established above indicate a wide disparity between the several Areas, and a severe unbalance of aeronautical development. They are difficult to compare through lack of a common denominator, hence it is considered advisable to resort to a system of ranking, based upon the individual ranks previously developed in Sections 2 and 4. In that ranking the bases used were as follows:

- (1) High to Low ratio of aircraft to population.
- (2) The most desirable airport coverage, with respect to both area coverage and ratio of weighted airport units to population.
- (3) Average or better ratio of aircraft to airports.

Application of these criteria was made in the previous sections and the ranks established are presented in the following tabulation for the purpose of establishing an Overall Rank:

RANK OF AREAS

Area	Aircraft to Population	Airports	Aircraft to Airports	Overall Appraisal
1	5	3	3	1
2	7	13	4	8
3	4	9	13	9
4	10	1	10	6
5	6	7	5	3
6	9	2	6	5
7	1	8	11	6
8	12	5	8	8
9	13	14	2	10
10	8	4	1	4
11	14	10	14	12
12	3	6	7	2
13	2	11	9	7
14	11	12	12	11

Overall rank was derived for each area from the individual ranks shown, with equal consideration to each, on the basis of minimum departure of each of

the three individual ranks from the overall rank being established.

From three separate approaches it is thus possible to arrive at a fair appraisal of the aeronautical development in the several areas of the State and to indicate certain unbalances which exist.

On all three scores the rank of Area 1, San Diego County, is more uniformly high than any other Area, and better than the State average in every respect, which unquestionably places it in top position among the Areas. That standing is justified by the following tabulation:

Qualification	Area No. 1 San Diego Co.	State Average
Aircraft per 10,000 Population (Table 60)	11.14	7.71
Persons per Aircraft-----	898.	1,297.
Persons per Family (1940 Census) -----	3.21	3.22
Families per Aircraft-----	280.	403.
Area per Airport—Square Miles (Table 53, Col. 3) -----	177.	383.
Weighted Units of Airport per 10,000 Population (Table 55) -----	2.36	2.19
Equivalent Class 1 Airports per 10,000 Population -----	.79	.73
Equivalent Persons per Class 1 Airport--	12,660.	13,700.
Ratio-Aircraft to Airports-----	21.8	17.6
Ratio-Aircraft to Weighted Units of Airport -----	4.7	3.5

The basis of projections shown in Part V is 400,000 non-scheduled aircraft in operation in the United States in 1955, which is equivalent to one for each 362 persons, or one for each 112 families. San Diego County already has 40 percent of that figure. Projections indicate its aircraft ownership will increase 426 percent by 1955 to 2,754 aircraft. With its projected population of 581,000, this represents 47.4 aircraft per 10,000 population, or one airplane per 66 families—a ratio almost twice as great as the projected national average, indicative of the present and future air-mindedness of the community.

The 24 civil airports of the Area (which includes those recently leased from the Navy) have a total weighted value of 111. The basis of weighting contemplates an average capacity of 25 aircraft per unit of weight, hence 111 units have an ultimate capacity of 2,775 aircraft—a number almost exactly equivalent to the anticipated 1955 load. The major deficiency is not, therefore, one of capacity but rather one of distribution or coverage. The recommended development in Area 1 (Appendix 1) seeks to correct local deficiencies in this

respect and also to provide access to all parts of the Area, both for recreation and protection of the watershed.

The foregoing discussion of San Diego County is an example of the methods used in this report in determining the deficiencies of each Area, and in seeking corrective treatment. A brief tabulation of all Areas with respect to their overall rank and their present status in comparison to Area 1 and the State average follows:

Overall Rank		Aircraft per 10,000 Pop.	Persons Per Aircraft	Families Per Family	Families Per Aircraft	Units of Airport per 10,000 Pop.	Ratio-Aircraft to Units/Airport
State Average		7.71	1,297	3.22	403	2.19	3.52
1 — Area 1		11.14	898	3.21	280	2.36	4.72
2 — Area 12		15.57	642	3.30	195	9.78	1.59
3 — Area 5		9.68	1,033	3.45	299	4.37	2.22
4 — Area 10		9.30	1,075	3.40	316	3.37	2.76
5 — Area 6		8.77	1,140	3.61	316	4.51	1.94
6 — Area 4		7.08	1,412	3.56	397	8.02	.88
7 — Area 7		34.83	287	3.15	91	54.85	.64
8 — Area 13		19.43	515	3.27	157	13.45	1.44
9 — Area 2		9.38	1,066	3.14	339	.84	11.17
10 — Area 8		4.96	2,016	3.52	573	3.24	1.53
11 — Area 3		11.49	870	3.80	229	19.78	.58
12 — Area 9		3.51	2,849	3.24	879	.78	4.50
13 — Area 14		6.36	1,572	3.20	491	10.01	.63
14 — Area 11		2.86	3,496	3.27	1,069	8.49	.34

The above tabulation indicates at a glance those Areas in which the greatest unbalance exists in per capita figures and in the relationship between aircraft and airport facilities. It might be argued that high ratios of aircraft and airports to population is desirable, but that premise can scarcely be accepted when each resultant unit of airport bears only one percent of unit capacity in aircraft. On the other hand, it is not contended that the ratio of aircraft to airport units need necessarily be at or near capacity, or that, if the ratio is below average, there has been an overdevelopment of airports in a particular area. Other justifications exist for more extensive development in many localities than can ever be justified by local private flying interest or potential. Among them are the need for large airports to provide air transport service to remote areas of relatively low population density; the need for adequate coverage of similar areas with emergency airports; the need for airports in or near recreational areas where no permanent local population warrants their construction; and special-use airports such as are required for forest protection.

It is recognized that, in a State having as radically diverse conditions as are represented in the fourteen Aviation Areas of California under discussion, it will never be possible to achieve uniformity or even approach average conditions in all of the areas with respect to aeronautical development. Compromises in the interest of safety, adequate coverage or special uses are mandated. Nevertheless, it is unquestionably possible to

secure more uniformity than is represented by the above tabulation, and to that end this report is dedicated.

The wide variation in aircraft per 10,000 persons from 2.86 in Area 11 to 34.83 in Area 7 will undoubtedly diminish as aircraft become more numerous. Present day motor registration varies between .27 and .36 per capita in the several Aviation Areas (Table 42). No such uniformity is anticipated in aircraft ownership. There probably always will be at least three times as many aircraft per capita in predominately rural areas as in those areas which are, to a large extent, urban in character. However, it should be pointed out that the present uniform ownership of automobiles was made possible by the advent of good roads, and in like manner aircraft ownership will tend to become more uniform as airports are available to all who wish to own and operate airplanes.

Airport construction must, therefore, precede demand and aid in creating that demand, if America is to maintain aeronautical supremacy—if it seriously intends to adopt aviation into its economic and social life and accept its benefits. Development, therefore, must proceed, first, at those points where potential demand is greatest in order to maintain reasonable balance, and secondly, at those points where actual local demand may never provide justification, but where benefits to all will accrue. Upon this principle the recommendations which follow in the Area Treatments have been established.

PART V—AERONAUTICAL PROJECTION

1. TRENDS IN AVIATION DEVELOPMENT

The Development of Airport Requirements

The life of an airport is, or should be, long; that of an airplane is comparatively short. Developments in aircraft design and changes in aircraft performance characteristics are rapid and continuous. In the relationship between ground facilities and the aircraft that will use them, lies the principal problem of the airport engineer, for the airport must outlive many generations of aircraft. It must be planned to meet the requirements of aircraft that, as yet, are scarcely beyond the dream stage in the mind of the most imaginative designer.

Unfortunately, it happens that features contributing to efficiency and high performance in flight are in many respects opposed to those which afford a quick take-off and a short landing run. It goes without saying that it is possible today to design aircraft having better take-off characteristics than any available in 1919; but, in so doing, other disadvantages of the aircraft of 25 years ago would have to be accepted. Evolutions in design, emphasizing improved performance, with minor concessions to take-off and landing characteristics, may have influenced airport design to a limited extent. But the tendency toward larger and still larger airports has been due in considerable part to the fact that increased experience and understanding have brought increased caution. Fields were being used blithely 25 years ago from which no responsible individual would operate today, even with the same type of aircraft. We are no longer satisfied with the bare minimum requirements. The relationship between airport size and safety is especially apparent in the current requirement that the design of the airport be such as to minimize the hazard to twin-engine aircraft resulting from the failure of one engine during take-off. Such an aspiration would have seemed fantastic when 2,000-foot airports were considered ample, or even extravagant.

Four factors influence competent professional or official opinion on the acceptable dimensions of an airport. All four have played some part within the last few years. They are:

1. Higher standards of safety requiring increased margins of safety.
2. Improvements in equipment and in operating technique.
3. Better understanding of the real performance characteristics of aircraft, which may heretofore have been viewed too optimistically.
4. Changes in the fundamental performance characteristics of aircraft.

Though these four factors have separate influences, they can be examined most easily through their combined action. A suitable starting point for the examination is an inquiry into how present ideas on runway requirements have been developed.

It should be pointed out at once that the first of the four factors, changes in aircraft performance, has been less important than commonly supposed in creating a demand for larger fields and longer runways. Research on the actual behavior of aircraft in normal take-offs and landings has had some influence, but far less than has the increasing emphasis on safety. A general increase in the safety of aircraft operation has been brought about through a refusal to tolerate those risks which were once considered more or less inevitable. It is this demand for safety, more than any change in the characteristics of aircraft or insistence on the part of the aircraft designer, that has resulted in the building of larger landing areas.

In 1929 the Bureau of Air Commerce ruled that any type of aircraft offered for Government approval must be able to leave the ground after a take-off run of not more than 1,000 feet, at sea level, in still air and under normal temperature and barometric conditions, carrying maximum gross load. There are few civil aircraft now operating in the United States which have not proved capable of taking off in the required 1,000 feet with the largest load they ever carry in service.

One thousand feet is an established minimum for performance tests but aircraft in actual operation often encounter conditions which make such a standard specification meaningless. Some of the most important of these conditions are:

1. Atmospheric conditions—temperature, pressure, humidity, etc.—at other than ideal standards.
2. Unfavorable runway or surface conditions.
3. Reduced aircraft performance due to natural deterioration in service.
4. Variations in pilot technique which introduce variables in aircraft performance.
5. Altitude effect resulting from the location of most airports at a higher altitude than sea level.

After allowances for all of these conditions it is obviously necessary, in a matter so deeply affecting safety, to allow for a certain reserve of maneuvering space.

In contrast to the conditions which lengthen the take-off run, there is one that generally shortens it. The standards presuppose still air, and stillness of the air is exceptional. Usually there is some wind, and a

breeze as gentle as ten miles an hour may reduce the take-off run by as much as one-fourth. One cannot, however, count upon the wind, and an airplane that has to take off whenever there is occasion to make a flight must be able to do so without the slightest help from that source.

It is almost impossible to safeguard a single-engine airplane from the possibility of accident on those infrequent occasions when a power failure occurs, unless such failure occurs at a reasonably high altitude over good natural landing terrain. Safety following power failure in any single-engine airplane is dependent upon pilot technique and maneuvering altitude. Power failure at altitude may be serious enough, but it does not enter into the determination of airport specifications. Only those rare engine failures that occur during or immediately after the take-off (say, before reaching an altitude of 600 feet) are pertinent. It is, of course, axiomatic that an airplane cannot be turned safely at a very low altitude if it has lost all power. In the event of engine failure with a single engine airplane immediately after taking off, or until it reaches an altitude ranging from 150 to 800 feet, depending on the type of aircraft, it is considered advisable to continue in the same direction in which the airplane is headed, landing straight ahead whatever the ground conditions may be, since landing in a wholly unprepared area would usually be less disastrous than attempting to turn with too little speed and altitude. To safeguard a single engine aircraft from trouble following an engine failure soon after take-off, the airport would have to be large enough to allow the airplane to take off, climb to a height of several hundred feet, suffer an engine stoppage, nose down, and land straight ahead without passing beyond the boundaries of the airport. No one, however, could expect airports adequate for such eventualities. A certain risk, inescapably attached to the dependence on one engine, is the price that has to be paid for single-engine compactness and economy.

Although it is agreed that airports cannot be constructed to protect a single-engine airplane from all dangers following engine failure, there is one more point to be considered as affecting runway lengths for such aircraft. Both because it makes the airplane easier to control and because it improves the rate of climb, any conservative pilot will attain a speed at least 20 percent above the take-off minimum before attempting maximum rate of climb—a condition dictating longer runways than the bare minimum required for take-off.

The single-engine airplane is a problem for the private owner and charter operator. Most of the certificated air carriers use aircraft with two or more engines, and for them, the problem of safety and space requirement after an engine failure is quite different.

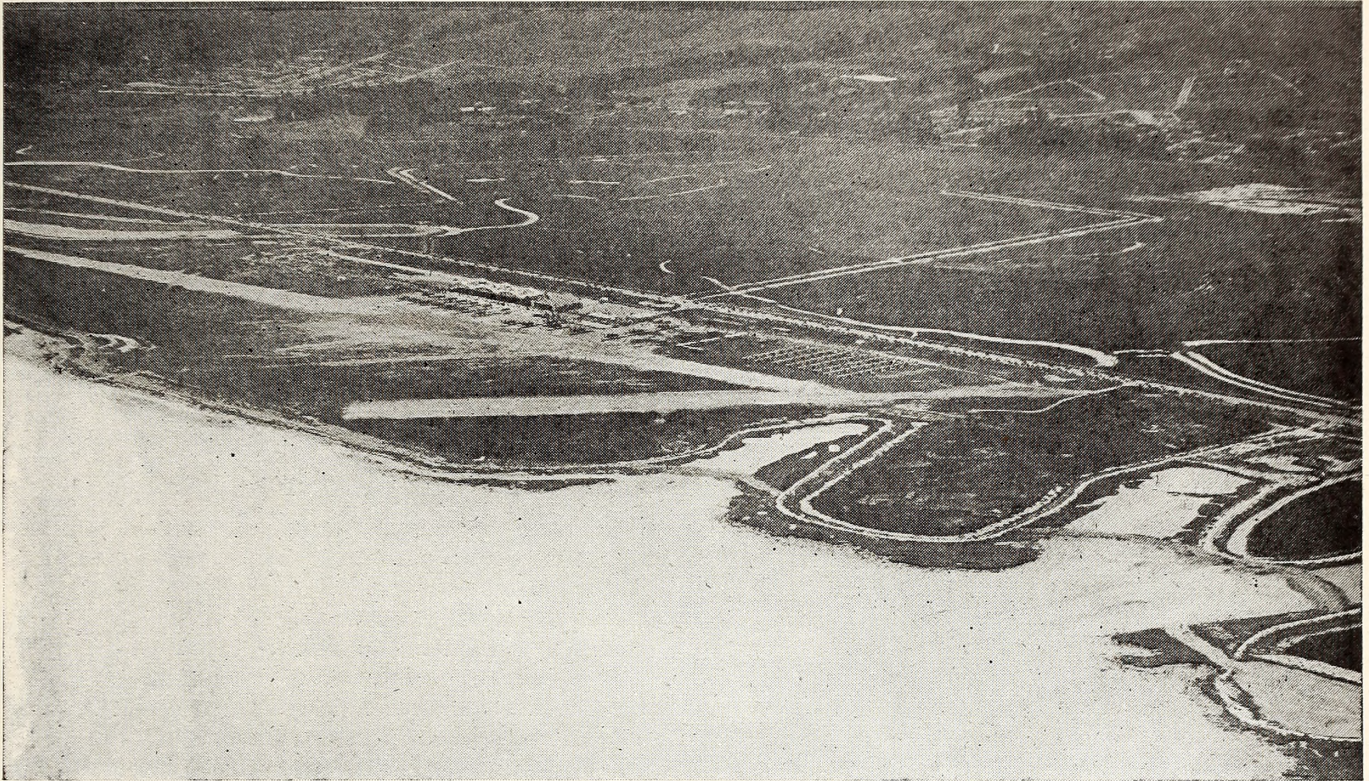
For any airplane, there is a narrow range of speed at which it requires less power to maintain flight than at any other speed. That range where flight is possible

with minimum power is usually some 25 to 40 miles an hour above the minimum possible take-off speed. When a twin-engine airplane completely loses the power of one engine, the other engine is expected to maintain level flight, or even permit a gentle climb under favorable conditions, but it can only do so if the flying speed is at or above that requiring minimum power. Consequently, if a twin-engine airplane takes off at the lowest possible speed, (which at present is probably in the 70 to 80 miles-per-hour speed range for typical transport airplanes) and if one engine fails immediately, while the aircraft is still flying at this same low speed, the remaining engine will not develop sufficient power to maintain level flight. The only remedy following such a failure, would be to nose down until the additional speed had been gained which would permit single-engine flight without further loss of altitude. In the meantime, the ground (or other obstruction) might be encountered. There is the further difficulty that, with one engine idle and the other pulling vigorously from its location well out on one wing, the tendency of the airplane to turn cannot always be overcome with the rudder when speed is low.

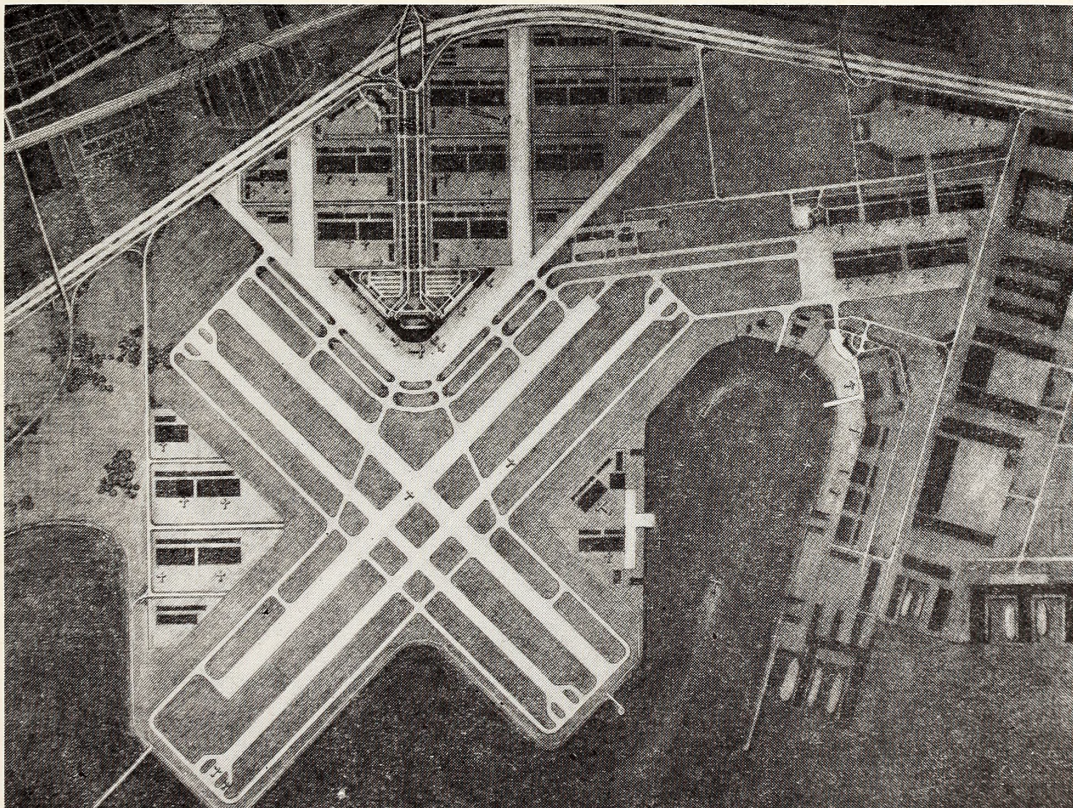
The resultant drag introduced by yawing and excessive use of the rudder further complicates the situation and prevents acceleration. This delicate situation has been eased somewhat by the general introduction of full-feathering propellers which reduce the apparent unbalance of power. Nevertheless, failure of one engine under the conditions described, places the twin-engine airplane in exactly the same position as a single engine aircraft when failure of power occurs immediately after take-off. Only one course is possible—a landing straight ahead whatever the obstacles. After an airplane is airborne and in level flight acceleration to minimum single engine operating speed may be attained in a few seconds. Hence each second gained before an engine failure under these critical conditions enhances the possibility for a successful single engine pull-out. For this reason Air Carrier operating procedure provides that aircraft will be taken off at speeds well above minimum and level flight assumed a few feet above the ground until minimum single-engine operating speed has been attained. An added advantage of this procedure is the reduction of the time interval during which maximum power is required of both engines during take-off.

The same difficulties may occur with four-engine aircraft, but obviously the situation is less critical. The failure of one engine deprives the airplane of only one-fourth of its power, instead of one-half and the turning effect from unbalanced distribution of power is correspondingly reduced so that it is always possible to hold a straight course at any speed down to the minimum for take-off. Even with a four engine airplane, however, it is preferable to have some reserve of speed, and to approach the speed of minimum power requirement before beginning to climb. While a two-engine

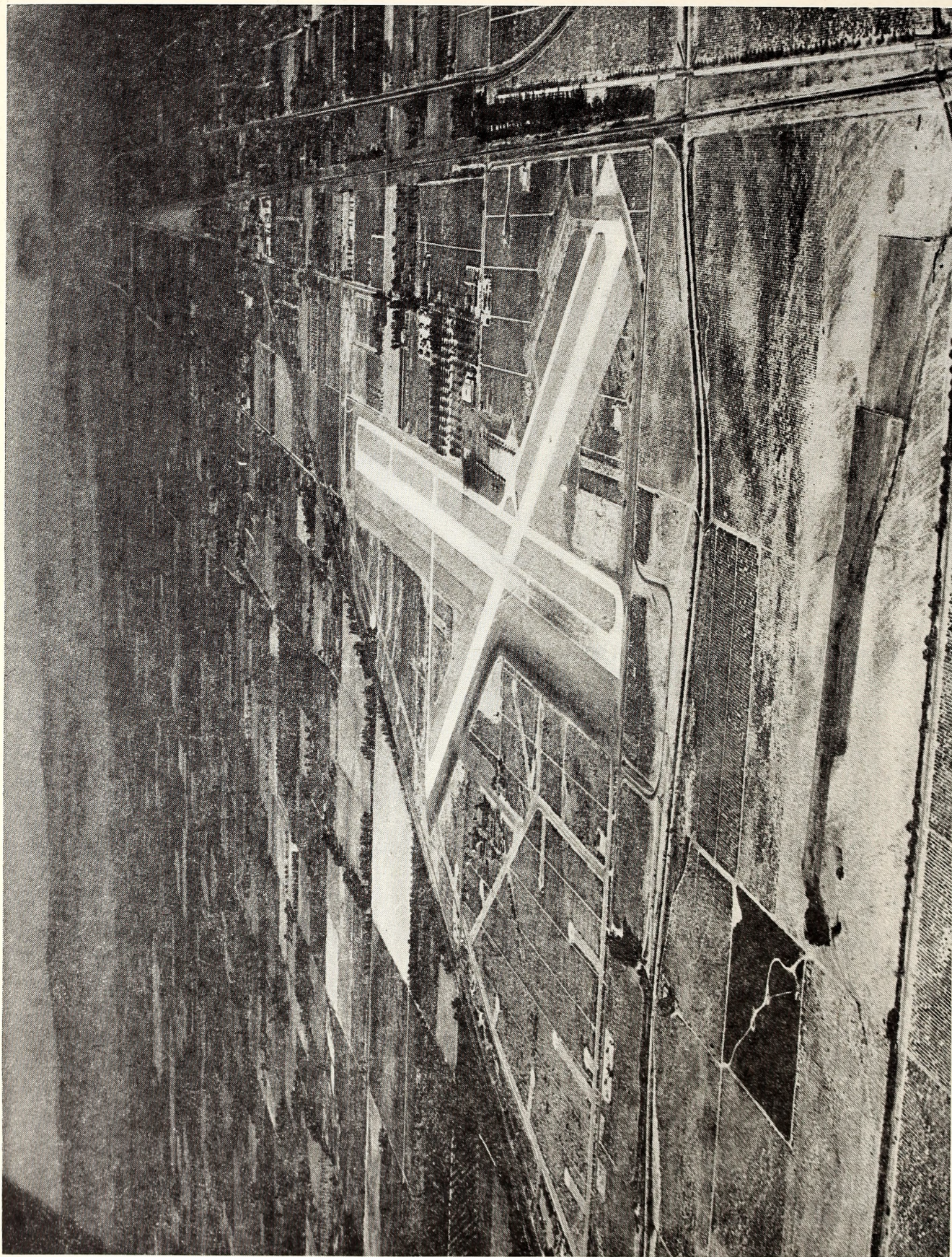
CHANGING CONCEPTS



SAN FRANCISCO AIRPORT—1928



SAN FRANCISCO AIRPORT PLAN FOR 1950



ONTARIO INTERNATIONAL AIRPORT

aircraft may well be held on or very close to the ground until the minimum take-off speed is exceeded by at least 30 or preferably 40 miles an hour, a four engine airplane needs a similar margin of only 20 or 30 miles an hour. Obviously, if these procedures so vital to safety are to be followed the airport must be large enough to permit such speeds within the airport's boundary.

The desire for ample excess speed, as in case of failure of one engine, would in itself, increase the length of runway needed for conservative take-off practice with a twin-engine airplane by from 50 to 100 percent. There is the further possibility that the failure of one engine may occur just before the proper speed for single-engine flight has been reached. To cope successfully with this emergency, airport conditions should allow the pilot to land and bring the airplane to a stop without going beyond the airport boundary. For this purpose clear, graded safety zones are frequently provided beyond the ends of paved runways.

The phrase "length of usable runway" refers to the fact that the effective dimensions of an airport may be largely determined by what lies beyond its boundaries. A climbing airplane follows at best a very gradual slope. It is from these slope ratios, of course, that the necessary slope for obstacle clearance is calculated. Thus if it appears that 20 to 1 is the proper ratio, and if there is a pole line or a building 60 feet high 800 feet from the edge of the airport in line with a runway, the multiplication of 60 by 20 gives a 1,200 foot horizontal distance; and for the type of aircraft having that slope of climb-path, that part of the runway lying within 400 feet of the boundary of the airport adjacent to the obstruction would not be usable. Obviously, it is undesirable that the obstacle-clearance slope be planned so that, where the most unfortunate conditions affect normal flight, the aircraft can barely scrape over the top of the obstacles. Some margin should be allowed, and it is sound foresight to project the height of any obstacle, other than a low fence at the end of the runway, by at least 20 feet in order that any calculation of flight path will include at least that amount of clear distance from the tops of buildings, wires or trees.

Similar considerations govern the landing path although their effect is not as serious due to the ability of the average aircraft to descend more steeply (with flaps extended) than it can climb. However, changing wind conditions may make today's landing path tomorrow's take-off path. All of these considerations have led to the adoption of minimum clearance angles for obstructions in approaches to runways which are now standard procedure in airport site selection and design. They are as follows:

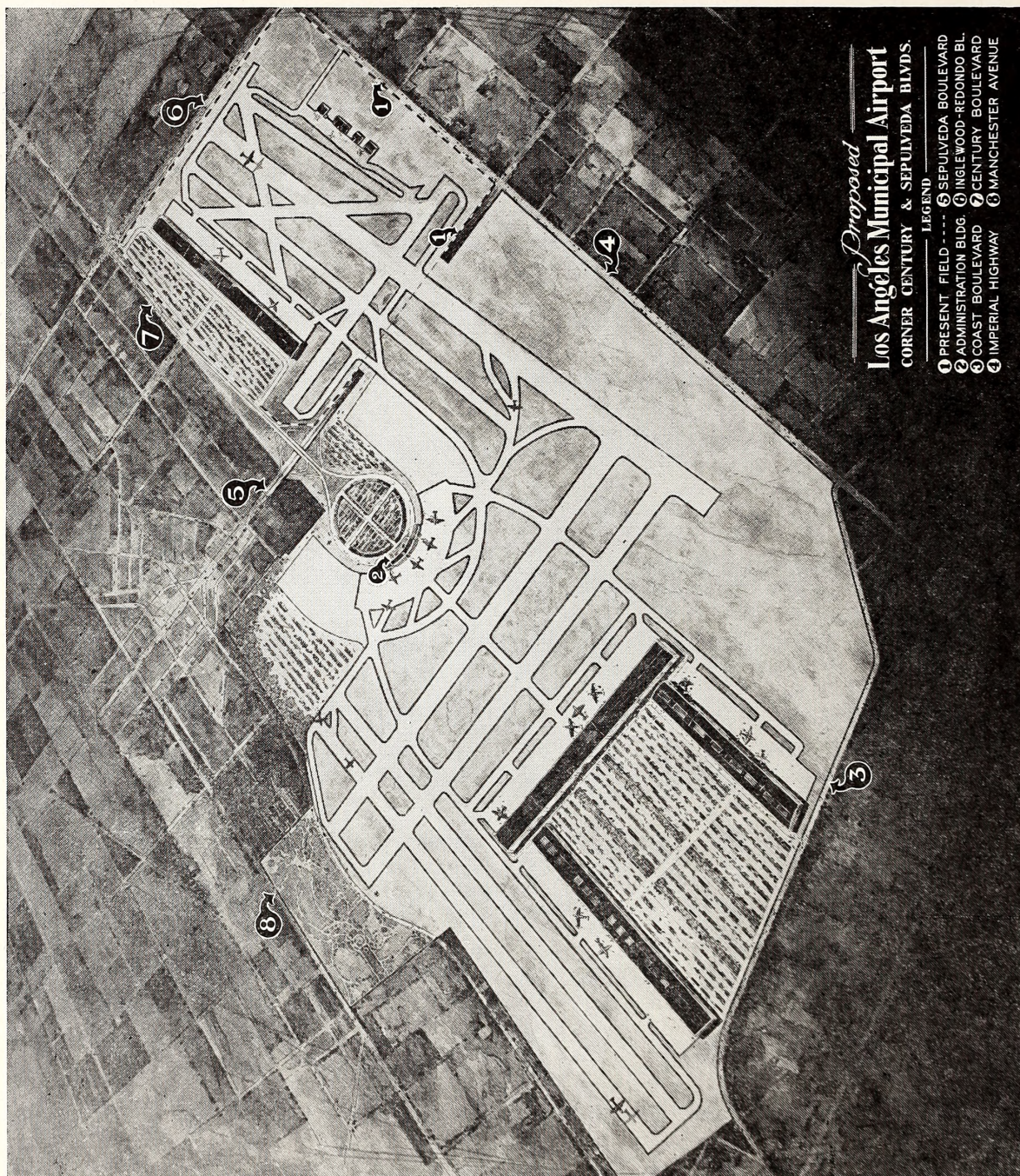
"Approaches shall be clear within a glide path of 20 to 1 from the end of the *usable area* in the case of Class 1 airports, and 30 to 1 in the case of Classes 2, 3, 4 and larger airports, except for instrument landing runways for which the ratio shall be 40 to 1. These

ratios represent the minimum permissible. In all cases it is highly desirable to clear approaches to runways on as flat a ratio as is possible in the interest of safety." (CAA "Airport Design" Manual)

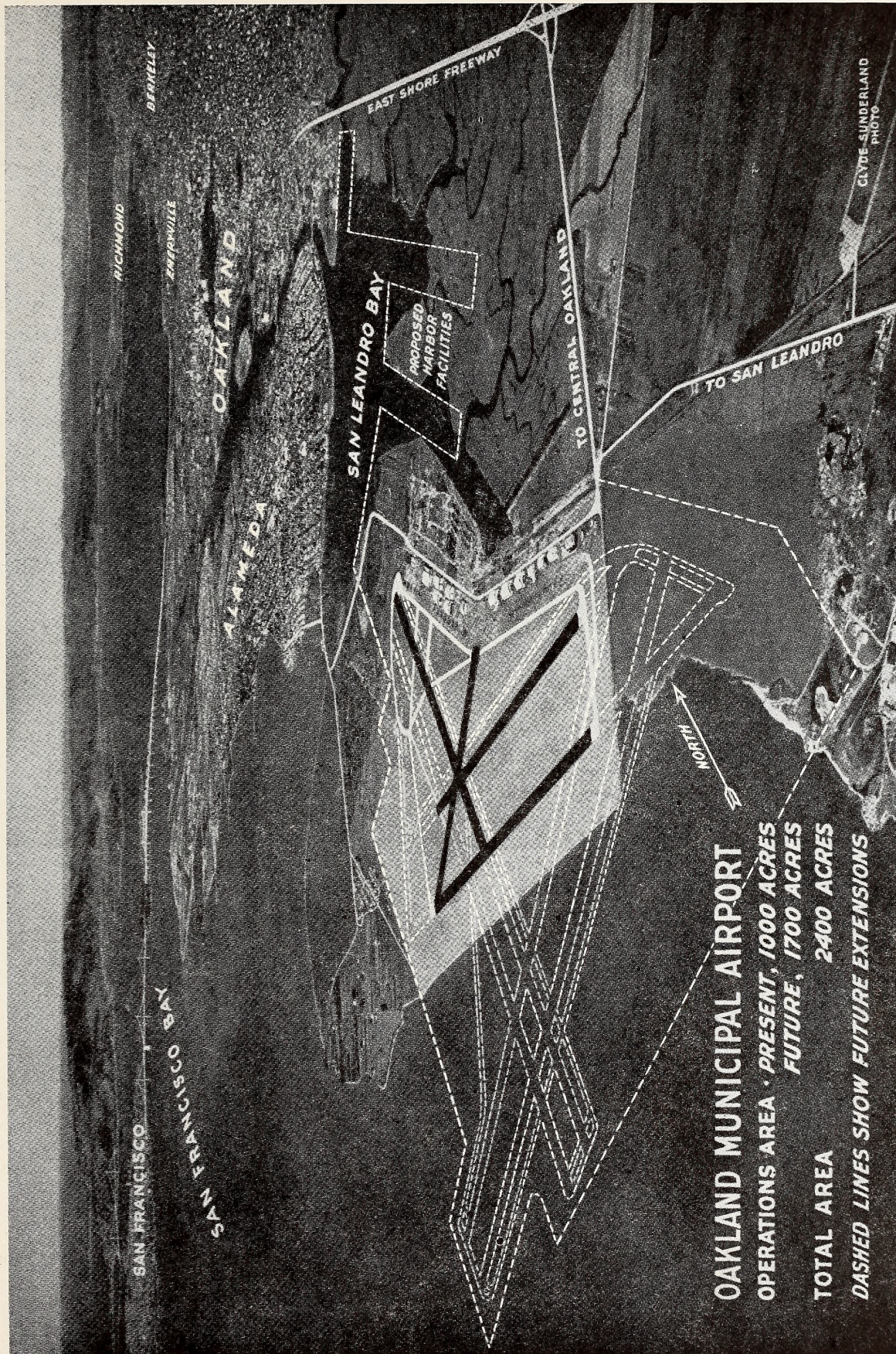
To achieve the desired objective outlined above it is now generally agreed that outright purchase of the land and resale less the "air-rights" or purchase or condemnation of air easements or rights to the air space over the land above specified altitudes is the only certain way of preventing incursions into the approach path of airports. Zoning can be applied generally to an area. It cannot be applied to one area for the benefit of another; hence, its use can be countenanced under law to provide a general maximum limit to structures. Below that limit air rights may be acquired only by outright purchase or easement. It must be pointed out that the desirable clearance ratios described above do not contemplate the regular use of the air space above the inclined plane described. They are, in effect, safety zones to provide for the occasional low approach and to afford ample clearance above terrain obstructions for the aircraft in normal glide or power-on approach to the runways.

The prime difference between take-off and landing is not in the distances that the two operations require under normal conditions, as these are much the same, but in the additional distances requisite for safety. On taking off, as discussed above at some length, these additional distances are made necessary by imperfect piloting technique or the failure of one engine in a twin-engine airplane. On landing, however, the necessary additional distances are needed, almost entirely, because of inadequate piloting, influenced in some cases by weather conditions, such as poor visibility or abnormally rough air.

The take-off can always be started from a fixed point and the entire usable length of the runway is available. The point of contact on landing, contrariwise, depends upon the accuracy with which the pilot judges the path of the airplane, from the moment he reduces power and begins his descent to the field. Exceptional skill and care may repeatedly bring the airplane to its first contact with the ground within 100 feet of the intended point, and so make it possible to place that point very near the end of the runway, leaving practically the full runway length available for checking the airplane's speed. Not all pilots, however, are so skillful, and even with good weather conditions, the policy of wisdom for some of them is to give all obstructions the widest possible berth. As a result, these pilots could hardly expect to touch ground closer than 600 or 800 feet beyond the point where they had passed the end of the runway, thus automatically deducting this length (600 to 800 feet) from the available stopping distance. Runway length requirements are also effected by the condition of the surface; whether it is wet or dry, rough or smooth. Action of brakes may be adversely affected as much as 50 percent by wet or rough surface.



ULTIMATE PLANNED DEVELOPMENT AT LOS ANGELES



THE CITY OF OAKLAND PROJECTS ITS AIRPORT PLAN

The foregoing considerations have contributed more to the rising standards of airport construction than any changes in take-off or landing characteristics of new aircraft. Increasing emphasis on safety at any reasonable cost dictates airport specifications more inexorably than any other consideration, and has resulted in the establishment of the system of airport classification described later in this Section. As a matter of operating procedure it has been generally agreed that regular air carrier operation requires Class 4 airports while feeder line operation presently requires, as a minimum, a Class 3 facility. These requirements have been adopted as standard for the purposes of this report.

The advent of all weather flying, and the imminent utilization of instrument landing aids at all major airports, has introduced a further requirement for longer and wider runways and greater approach clearances, and has resulted in design requirements for at least one so-called "instrument runway" at each major terminal. One such runway generally suffices since instrument conditions usually occur under conditions of low wind velocity. Safety is again the major consideration for still higher standards on instrument runways. Aircraft approaching for a landing through low clouds depend upon radio guidance to the end of the runway. If all procedures are followed precisely by the pilot the aircraft should theoretically arrive over the end of the runway at an altitude, and in proper position, to complete a landing in the usual manner. But again, variables enter which preclude such extreme accuracy as a routine matter. Precaution against too low a descent in the approach zone, too far back from the airport, usually introduces an error in the interest of safety which brings the airplane over the end of the runway at a higher altitude than was intended in the design of the system. Arrival at an altitude of 100 feet instead of 25 feet would shorten the usable length of runway by almost 1,000 feet. Moreover, under instrument conditions the runway surface may be wet and thus reduce braking effect. The net result is the necessity of a minimum length of 6,000 to 8,000 feet on instrument runways which is often extended to 10,000 feet. These longer runways reduce the need for minute accuracy in instrument approach technique and hasten the day when airline schedules will be maintained regardless of weather.

Runway lengths of all classes of airports are uniformly affected by altitude of the site above sea level. Reduced barometric pressure at altitude creates two adverse effects on aircraft performance. In non-supercharged engines of smaller aircraft it results in a power loss and in all aircraft it results in the need for greater speed to produce equal lift; hence the need for increased runway length at altitude. The standard rule-of-thumb increase provided is 25 feet of length (added to minimum length for Class) for each 100 feet above sea-level. Thus a Class 4 airport requiring a 4,500 foot

runway at sea level would require 5,500 feet at 4,000 feet elevation.

This same altitude effect is frequently encountered on runways having the prescribed length for actual altitude, whenever an extremely low barometric pressure prevails or when high temperatures create similar thermal effects. These latter conditions are present on all airports and must not be confused with the design requirement for additional length corresponding to altitude above sea level. They are included in the variations enumerated above which necessitate increased runway length in every case in the interest of safety.

Airport requirements for any community are dictated to a considerable degree by the type of aircraft which the facility is intended to serve. Class 4 or larger airports may be expected to serve any existing type of aircraft but not all airports can be developed to such an extent, nor is it intended that they should be. It seems entirely probable that the present typical private-owner type of airplane may be expected to continue to operate, with a comfortable margin of safety, from airports having 1,800 feet of usable runway—minimum Class 1 requirement. All non-scheduled aircraft can probably do with Class 2 facilities. Capacity of these Classes is shown in a following tabulation. Airport builders must decide:

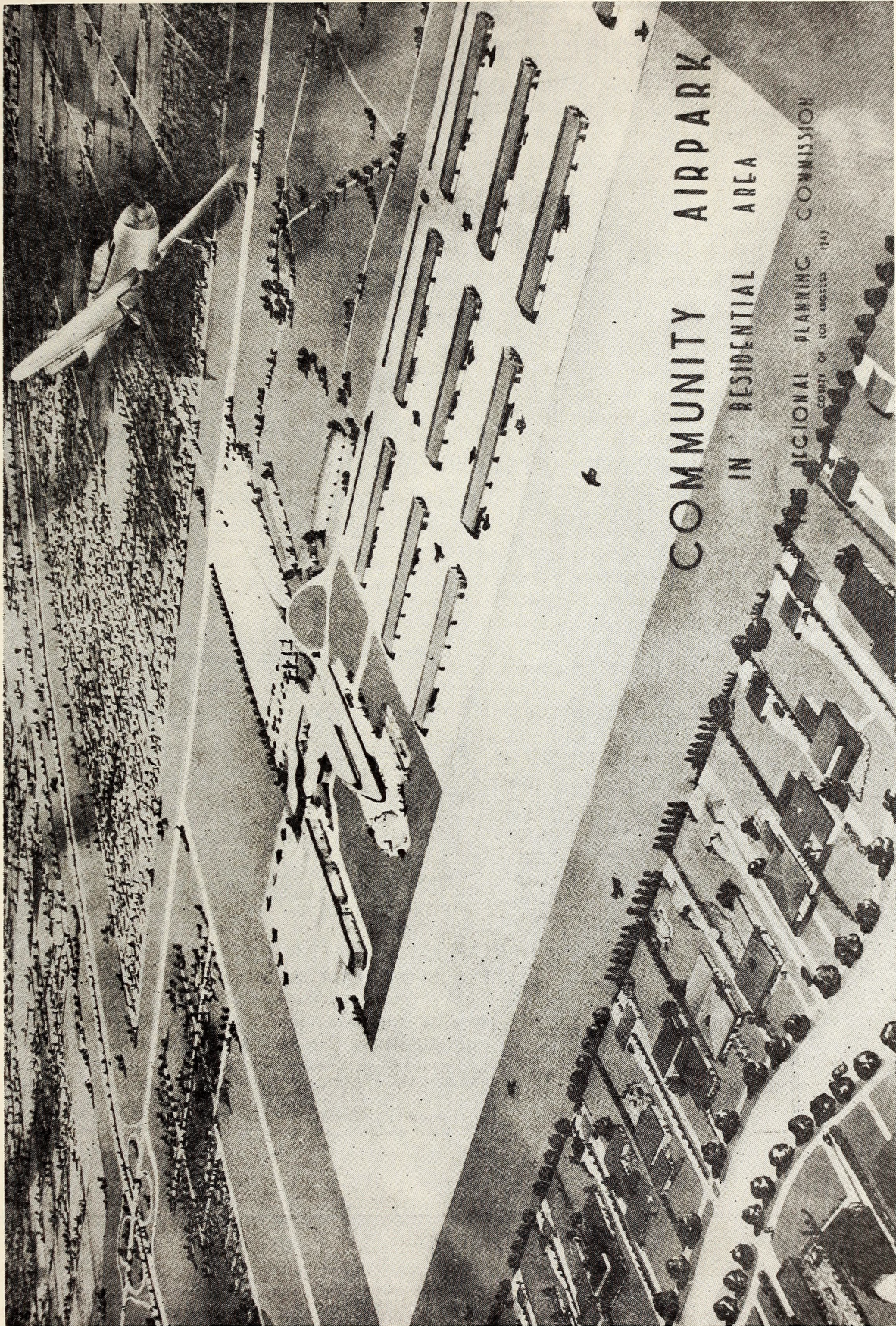
- (1) What class or classes of aircraft they desire to serve,
- (2) How many aircraft they wish to accommodate,
- (3) What alternate facilities are located nearby for larger aircraft,
- (4) What land is available,
- (5) Whether one Class 2 would better serve than two Class 1 airparks, etc.

Ordinarily, in a city of 100,000 or more, one major air terminal and a circumferential chain of Class 1 airparks or Class 2 airports would be preferable and more economical than three large airports of the same total capacity, and development along this line is recommended because of the flexibility of such a program.

In a smaller community requiring only one airport, the design should provide definitely for stage expansion to the maximum Class anticipated—this dependent upon the proximity of suitable airline or cargo airports in nearby communities. In this report it has been assumed that Class 3 and larger airports have a service radius of 25 miles, while Class 1 and 2 have a service radius of 10 to 15 miles.

In general, the shorter the runway found acceptable, the cheaper the airport will be and the easier it will be to find a suitable site.

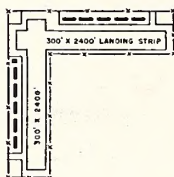
Class 1 and 2 airports may readily be developed into desirable community recreational centers or "Airparks". The accompanying photographic reproductions of design drawings for airparks now under construction illustrate the possibilities in this connection. The old conception of an airport as a place of noise,



TYPICAL COMMUNITY AIRPORT PLAN

CLASSIFICATION OF AIRPORTS

CIVIL AERONAUTICS ADMINISTRATION
AIRPORTS SERVICE



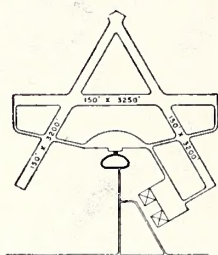
CLASS
1

PRIVATE OWNER SMALL TYPE AIRCRAFT.

2 TO 5 PLACE

ADEQUATE FOR AIRCRAFT UP TO 4000 # GROSS WEIGHT.
FOR SMALL COMMUNITIES AND AUXILIARY AIRPORTS IN
METROPOLITAN AREAS.

LANDING STRIPS 1800 TO 2700 FEET IN LENGTH.



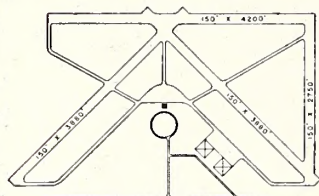
CLASS
2

PRIVATE OWNER LARGER TYPE AIRCRAFT AND SMALL TRANSPORT AIRCRAFT.

UP TO 20 PLACE

ADEQUATE FOR AIRCRAFT UP TO 15000 # GROSS WEIGHT
COMMUNITIES OF 5000 TO 25000 POPULATION.

RUNWAYS 2500 TO 3500 FEET IN LENGTH.



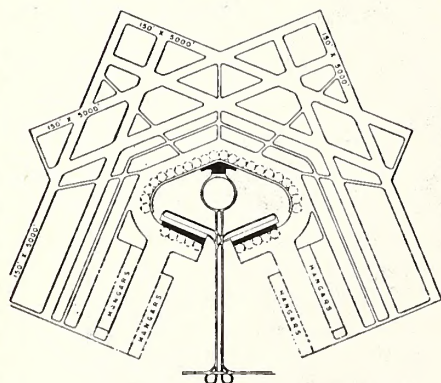
CLASS
3

PRESENT DAY TRANSPORT AIRCRAFT.

UP TO 30 PLACE

ADEQUATE FOR AIRCRAFT UP TO 50000 # GROSS WEIGHT.
CITIES OF 25000 TO 250000 POPULATION.

RUNWAYS 3500 TO 4500 FEET IN LENGTH.



CLASS
4

AND

CLASS
5

LARGEST AIRCRAFT NOW IN USE AND THOSE PLANNED FOR THE IMMEDIATE FUTURE.

30 PLACE AND LARGER

ADEQUATE FOR AIRCRAFT OVER 50000 # GROSS WEIGHT.
MAJOR METROPOLITAN CENTERS AND AIR TERMINALS.

CLASS 4 RUNWAYS 4500 TO 5500 FEET IN LENGTH.
CLASS 5 RUNWAYS 5500 FEET IN LENGTH AND OVER.



NOTE: Runway Lengths Given Are For Sea Level.
Higher Altitude Requires Greater Runway Lengths.

dust and confusion is fast giving way to the new conception of a park with all of the usual adjuncts for pleasure and recreation.

Similarly the changing conception of major air terminals is graphically illustrated by the accompanying photographs of projected developments at California's principal cities.

AIRPORT CLASSIFICATIONS

Class	Recommended Requirements				
	1	2	3	4	5
Landing Strip Minimums					
Length—with clear approaches ^a -----	1800'	2700'	3700'	4700'	5700'
Width—clear and usable-----	300'	500'	500'	500'	500'
Paved Runway Minimums					
Length—with clear approaches ^a -----	1800'	2500'	3500'	4500'	5500'
Width—day only-----	50'	100'	--	--	--
Width—day and night-----	75'	150'	150'	150'	150'
Width—instrument-----	--	--	200'	200'	200'
Landing Strip and Runway Gradients					
Transverse—maximum-----	2%	2%	1½%	1½%	1½%
Longitudinal—maximum-----	2%	1½%	1½%	1%	1%
Approach Clearances					
Noninstrument runways-----	20/1	30/1	30/1	30/1	30/1
Instrument runways-----	--	--	40/1	40/1	40/1
Runway Alignment—Min. % of winds (incl. calm) required to be covered within 22½°-----	70%	75%	80%	90%	90%

^a Landing strip and runway lengths shown are minimum sea level lengths which must be increased 25 feet for each 100 feet of altitude at the site.

^b Pavement not required at Class I airports. If desired or made necessary by quality of soil the minimums shown in parenthesis will apply.

Consult "Airport Design," CAA Handbook of April 1, 1944, for additional requirements relative to taxiways, ground clearances, buildings, facilities, lighting, etc.

AIRPORT USE AND CAPACITY BY CLASSES

CLASS 1—Serves: Small communities (5,000 Pop.) not on air carrier or feeder systems; or larger communities as auxiliary private fields.

Accommodates: Non-scheduled private flying activities. Small private owner type aircraft up to 4,000 pounds Gross Weight.

Maximum Capacity: 75 to 100 Private owner or business Aircraft. Not more than 1 Flying School. (Weighted Value—3 Units)

Required Facilities: Drainage, fencing, marking, wind tee and basic lighting.

CLASS 2—Serves: Communities of 5-25,000 Population as base for all types of non-scheduled operations and limited feeder-line operations.

Accommodates: Larger private aircraft and smaller feederline aircraft from 4,000 to 15,000 pounds Gross Weight.

Maximum Capacity: 100 to 150 Private owner aircraft, 1 or 2 Flying Schools and limited feederline use. (Weighted Value—5 Units)

Required Facilities: Drainage, fencing, marking, wind tee, lighting, hangar and shop, fueling, weather service, office space.

CLASS 3—Serves: Important cities on feeder routes and intermediate points on main line airways having population range of 25,000 to 300,000.

Accommodates: Present day twin-engine transport aircraft up to 50,000 pounds Gross Weight.

Maximum Capacity: 150 Private owner or business aircraft, 1 or 2 Flying Schools and not over 5 air carrier or feeder operations per hour. (Weighted Value—8 Units)

Required Facilities: Drainage, fencing, marking, wind tee, lighting, hangar and shops, fueling, weather bureau, visual traffic control, two-way radio, instrument approach system (when required).

CLASS 4, CLASS 5—Serve: Major industrial centers of the State and Nation and important junction points or terminals on the airways system.

Accommodates: Largest aircraft in use at present or planned for the immediate future with gross weights upward of 50,000 pounds and high wing and power loading.

Maximum Capacity: Single runway system—not over 60 contact operations per peak hour or 12 instrument operations per peak hour. Dual runway system—not over 120 contact operations per peak hour or 25 instrument operations per

peak hour. In general, Class 4 and 5 airports will be restricted to radio-equipped air carrier, commercial and private aircraft operating under Airway Traffic Control. As loads approach above capacities, provisions must be made for segregation of all non-scheduled traffic. (Class 4 Weighted Value—10 Units; Class 5 and over—12 Units)

Required Facilities: Same as Class 3 plus Administration Building.

Recommended Spacings Between Airports

Classes	Miles—Center to Center			
	1	2	3	4 and Over
1-----	2	3	4	5
2-----	3	4	5	6
3-----	4	5	6	7
4 and over---	5	6	7	8

Above figures are minimums for contact operations. Under instrument conditions airports not equipped for instrument flight will be expected to conform to requests of traffic control at nearest instrument airports.

Two or more instrument airports must be so located as to prevent interference between instrument flights in holding and final approach patterns.

Size and Type of Aircraft

As has been indicated, airport design requirements are not predicated upon aircraft performance characteristics, but rather upon safety considerations. The advent of the 50-ton airplane has not, of itself, affected runway lengths, although it has necessitated heavier pavements. Nor is it anticipated that future designs will necessitate drastic changes. Future developments in airport design will center around the need for increased capacity and the orderly control of air traffic to provide the utmost utility. Parallel runway systems can triple operations. Ample parking and loading facilities are of utmost importance. Ground movement of aircraft must be reduced to the minimum. Modern air-

line services, which further illustrates the need for Class 3 minimum facilities at all existing and projected intermediate or feeder-line stops.

Other new feeder-line aircraft are now being developed which may make possible the successful routine operation of feeder services from Class 2 airports, but these probably will be employed on routes offering fewer revenue passengers than are presently considered as a minimum potential.

Private, or personal use, aircraft of the postwar era are similar in all respects to the standard designs of the past decade. No radical departure is anticipated, although refinements will improve performance somewhat. The airplane noise problem is receiving serious attention and relief therefrom will soon be afforded both to passengers and those on the ground beneath. A recent innovation, of possible future importance in the design of smaller airports, is described as the castor-wheel landing gear which is said to reduce the effect of drift in cross-wind landings. Briefly, the airplane equipped with this type of landing gear, approaches for a landing in a "crabbed" attitude, or headed into the crosswind just enough to offset drift across the runway. The castor landing gear permits contact with the runway in the direction of actual travel (parallel to the runway) and permits deceleration on the runway while maintaining its heading into the wind. This innovation may ultimately minimize cross-wind landing difficulties and permit full-time use of two-way fields, thus eliminating the need for multiple runway systems.

Other than the above innovation, there appears to be no development on the horizon which will seriously affect existing airport standards.

Helicopters

Aircraft of the rotary wing type have long been considered the ultimate in desirability because of their ability to rise almost vertically from an area only slightly larger in diameter than their own wing span, and to descend in the same manner in a very restricted area. Great impetus was given to the development of this type during the war and considerable progress was made toward the solution of their inherent problems. However, their operation is still too complex for general adaptation, and much additional research and development will be required before this type receives widespread acceptance. The problem of "Heliports" is therefore not considered seriously in this report, nor is it believed that this type of aircraft will be perfected to a degree to permit general use by 1955. Present-day airports will supply all such facilities as are needed for several years in the future.

As a sign of the times, however, it may be mentioned that helicopters were successfully employed in a three-week trial demonstration during July, 1946, in the distribution of airmail arriving at Burbank, California, to

the local post offices at several cities contiguous to Los Angeles, and in the collection and rapid dispatch of outgoing airmail. So successful was the demonstration in expediting the collection and distribution of airmail in Los Angeles' far-flung territory, that bids from civilian contractors were requested to make the service permanent. A Civil Aeronautics Board certificate was recently awarded for the establishment of such service from Los Angeles Airport over three circular routes to 30 post offices within a 50-mile radius. Landings will be made on post office roofs wherever possible. Three trips daily will comprise the initial schedule.

The foregoing indicates that, while the overall performance of the helicopter is considerably less than the airplane, and its operating cost is considerably higher, development has reached the stage where it holds promise for special uses such as that envisioned above. It has already proven its worth in air rescue and in depositing medical aid and supplies in inaccessible and isolated areas. Its use in forest fire control is also receiving special consideration at the present time.

All Weather Flying

Cancellation of scheduled air carrier flights because of low ceilings or inadequate visibility at terminals has long been the principal barrier to dependable, year-round air transport. It is no blanket condemnation of the industry that flights have, of necessity, been cancelled due to adverse weather. Man has navigated the seven seas for centuries, but as yet he has not fully overcome the vagaries of the weather. All forms of transportation are slowed down by adverse weather, but an airplane in flight cannot slow down or stop to await better conditions. It must keep moving at a speed of at least 100 miles per hour or disaster is certain to follow. Hence, it has been the choice of wise operators to allow their aircraft to stand idle on the ground rather than send them aloft when conditions at terminal points precluded reasonably safe descent.

The skilled pilot, utilizing radio range facilities which have been standard for fifteen years can navigate safely through adverse weather, if sufficient altitude is maintained to clear all terrain obstructions. He can arrive unerringly at his destination and descend to a safe altitude in the general location of the terminal airport. However, he does require proper ceiling and visibility to make final observations during his approach for landing. Lacking such conditions it has, until recently, been impossible to complete the landing.

Prior to the war the Instrument Landing System (ILS) was nearing perfection in experimental laboratories. It provides two radio beams, one directional toward the runway and one inclined downward in the normal glide path which the pilot follows by means of indicators on the instrument panel, for a safe approach to the invisible runway. The system was service tested during the war and improved to eliminate many of its

shortcomings. One major improvement has been the coupling of the radio waves to the electronic pilot which permits the entirely-automatic landing of the aircraft.

Another wartime development based upon Radar was the Ground Controlled Approach System, by means of which aircraft in flight near a ground station (on the airport) can be directed in the proper path by voice communication and "talked down" to the end of the runway. A combination of these two systems, together with high intensity approach lights and contact lights, now offers a solution to the problem of all-weather flying. In the not distant future, aircraft will arrive and depart on schedule as regularly as surface carriers now do under similar weather conditions.

Other aids to all weather flying include the war-born "FIDO" system for the dispersal of dense ground fog, by heating the air over the runway. Extensive experiments are being conducted jointly by the air carriers, the Naval Air Service, the Army Air Forces and the Civil Aeronautics Administration at the Landing Aids Experiment Station at Humboldt County Airport, Arcata, California, seeking improvement to this vital aid to all weather flying. Consideration is now being given to a Congressional appropriation to provide all of the latest adjuncts of "instrument approach" to the Nation's leading airports. Such installations are contemplated at San Francisco and Los Angeles Airports.

TABLE 63
POPULATION PROJECTIONS—CALIFORNIA AVIATION AREAS AND COUNTIES
1946 TO 1950 AND 1955

Area County	July 1, 1946			1950			Percent over 1946	1955			Percent over 1950
	Population	Percent of Cali- fornia	Percent of U. S.	Population	Percent of Cali- fornia	Percent of U. S.		Population	Percent of Cali- fornia	Percent of U. S.	
United States.....	141,000,000	-----	100.00	145,500,000	-----	100.00	4.19	150,000,000	-----	100.00	3.09
California.....	9,335,000	100.00	6.62	9,935,000	100.00	6.83	9.37	11,117,500	100.00	7.41	11.90
Area 1. San Diego....	470,500	5.04	.33	514,900	5.18	.35	8.51	581,000	5.22	.39	12.84
Area 2. Los Angeles Metropolitan.....	4,089,535	43.81	2.90	4,434,442	44.63	3.05	10.90	5,024,350	45.19	3.35	13.30
Los Angeles.....	3,597,500	38.54	2.55	3,921,850	39.48	2.69	10.99	4,444,075	39.97	2.96	13.32
Orange.....	170,700	1.83	.12	186,750	1.88	.13	11.49	211,350	1.90	.14	13.17
West Riverside*	108,375	1.16	.08	111,562	1.12	.08	10.76	126,375	1.14	.09	13.28
S.W. San Bernardino*	212,960	2.28	.15	214,280	2.15	.15	8.85	242,550	2.18	.16	13.19
Area 3. Desert.....	121,865	1.31	.09	126,158	1.27	.09	8.73	143,150	1.29	.09	13.47
Imperial.....	56,700	.61	.04	59,750	.60	.04	7.46	67,950	.61	.04	13.72
Riverside*	36,125	.39	.03	37,188	.37	.03	10.76	42,125	.38	.03	13.28
San Bernardino*	29,040	.31	.02	29,220	.30	.02	8.85	33,075	.30	.02	13.19
Area 4. Kern.....	192,000	2.06	.14	197,400	1.99	.13	6.37	222,700	2.00	.15	12.82
Area 5.....	400,650	4.29	.28	421,500	4.24	.29	11.39	477,600	4.29	.32	13.31
Monterey.....	103,000	1.10	.07	106,500	1.07	.07	9.56	120,500	1.08	.08	13.15
San Benito.....	14,450	.16	.01	13,700	.14	.01	5.79	15,600	.14	.01	13.87
San Luis Obispo.....	47,000	.50	.03	47,800	.48	.03	7.78	53,900	.48	.04	12.76
Santa Barbara.....	87,700	.94	.06	95,500	.96	.07	13.35	107,500	.97	.07	12.56
Santa Cruz.....	58,000	.62	.04	58,950	.59	.04	14.47	66,700	.60	.04	13.15
Ventura.....	90,500	.97	.07	99,050	1.00	.07	12.37	113,400	1.02	.08	14.48
Area 6.....	459,400	4.92	.33	460,850	.464	.32	11.38	518,900	4.67	.34	12.60
Fresno.....	237,500	2.54	.17	240,200	2.42	.17	11.20	270,600	2.44	.18	12.66
Kings.....	44,400	.48	.03	45,700	.46	.03	12.00	51,450	.46	.03	12.58
Madera.....	32,500	.35	.03	32,750	.33	.02	10.83	36,750	.33	.02	12.21
Tulare.....	145,000	1.55	.10	142,200	1.43	.10	11.62	160,100	1.44	.11	12.59
Area 7.....	11,485	.12	.01	11,700	.12	.01	6.36	12,975	.12	.01	10.90
Alpine.....	285	-----	-----	270	.01	-----	8.00	298	.01	-----	10.37
Inyo.....	9,800	.11	.01	10,155	.10	.01	6.89	11,240	.10	.01	10.68
Mono.....	1,400	.01	-----	1,275	.01	-----	2.00	1,437	.01	-----	12.71

TABLE 63—Continued
POPULATION PROJECTIONS—CALIFORNIA AVIATION AREAS AND COUNTIES
1946 TO 1950 AND 1955

Area County	July 1, 1946			1950			Percent over 1946	1955			Percent over 1950
	Population	Percent of Cali- fornia	Percent of U. S.	Population	Percent of Cali- fornia	Percent of U. S.		Population	Percent of Cali- fornia	Percent of U. S.	
Area 8.....	388,900	4.17	.28	409,850	4.12	.28	11.83	461,175	4.15	.31	12.52
Calaveras.....	9,450	.10	.01	9,700	.10	.01	14.79	10,850	.10	.01	11.85
Mariposa.....	4,300	.05	-----	4,400	.04	-----	8.64	4,950	.05	-----	12.50
Merced.....	55,500	.59	.04	57,400	.58	.04	9.65	64,700	.58	.05	12.72
San Joaquin.....	192,000	2.06	.14	203,550	2.05	.14	10.33	229,275	2.06	.15	12.64
Stanislaus.....	116,650	1.25	.08	123,500	1.24	.08	15.42	138,750	1.25	.09	12.35
Tuolumne.....	10,950	.12	.01	11,300	.11	.01	11.33	12,650	.11	.01	11.95
Area 9. San Francisco Metropolitan.....	2,515,150	26.94	1.78	2,654,150	26.72	1.82	6.06	2,891,500	26.01	1.93	8.94
Alameda.....	721,500	7.73	.51	767,500	7.73	.53	3.86	837,000	7.53	.56	9.06
Contra Costa.....	278,500	2.98	.20	265,000	2.67	.18	.19	290,000	2.61	.19	9.43
Marin.....	75,600	.81	.05	80,500	.81	.05	4.34	87,000	.78	.06	8.07
Napa.....	42,700	.46	.03	45,250	.46	.03	5.97	49,875	.45	.03	10.22
San Francisco.....	775,000	8.30	.55	838,250	8.44	.57	8.16	898,375	8.08	.60	7.17
San Mateo.....	179,000	1.92	.13	198,150	1.99	.14	11.32	226,575	2.04	.15	14.35
Santa Clara.....	236,000	2.53	.17	242,000	2.44	.17	8.04	264,500	2.38	.18	9.30
Solano.....	119,750	1.28	.08	127,500	1.28	.09	7.14	140,000	1.26	.09	9.80
Sonoma.....	87,100	.93	.06	90,000	.90	.06	8.30	98,175	.88	.07	9.08
Area 10.....	386,140	4.14	.27	400,200	4.03	.28	10.67	447,750	4.03	.30	11.88
Amador.....	8,200	.09	.01	8,150	.08	.01	9.40	9,025	.08	.01	10.74
El Dorado.....	14,850	.16	.01	14,950	.15	.01	10.33	16,650	.15	.01	11.37
Nevada.....	19,400	.21	.01	19,250	.19	.01	12.24	21,500	.19	.02	11.69
Placer.....	33,250	.36	.02	33,500	.34	.02	8.59	37,375	.33	.02	11.57
Sacramento.....	224,000	2.40	.16	231,000	2.33	.16	8.71	256,750	2.31	.17	11.15
Sierra.....	2,490	.03	-----	2,550	.03	-----	7.37	2,800	.03	-----	9.80
Sutter.....	24,900	.26	.02	27,000	.27	.02	19.73	31,250	.28	.02	15.74
Yolo.....	34,300	.37	.20	37,800	.38	.03	14.55	43,150	.39	.03	14.15
Yuba.....	24,750	.26	.02	26,000	.26	.02	17.12	29,250	.27	.02	12.50
Area 11.....	101,250	1.08	.07	100,400	1.01	.07	4.25	106,550	.96	.07	6.13
Del Norte.....	5,100	.05	-----	4,150	.04	-----	7.79	4,350	.04	-----	4.82
Humboldt.....	53,100	.56	.04	52,600	.53	.04	.77	55,650	.50	.04	5.80
Lake.....	10,750	.11	.01	10,500	.11	.01	10.52	11,000	.10	.01	4.76
Mendocino.....	33,450	.36	.02	33,150	.33	.02	7.80	35,550	.32	.02	7.24
Area 12.....	95,050	1.02	.07	102,050	1.03	.07	14.27	115,900	1.04	.08	13.57
Butte.....	53,100	.57	.04	58,000	.58	.04	15.88	66,250	.60	.05	14.22
Colusa.....	10,000	.11	.01	10,550	.11	.01	8.76	11,400	.10	.01	8.06
Glenn.....	15,350	.16	.01	17,000	.17	.01	19.72	19,375	.17	.01	13.97
Tehama.....	16,600	.18	.01	16,500	.17	.01	7.49	18,875	.17	.01	14.39
Area 13.....	40,150	.43	.03	40,800	.41	.03	4.48	45,150	.41	.03	10.66
Lassen.....	19,000	.21	.01	19,350	.19	.01	3.20	21,300	.19	.01	10.08
Modoc.....	9,650	.10	.01	10,550	.11	.01	9.89	11,775	.11	.01	11.61
Plumas.....	11,500	.12	.01	10,900	.11	.01	1.87	12,075	.11	.01	10.78
Area 14.....	62,925	.67	.04	60,600	.61	.04	6.27	68,800	.62	.04	13.53
Shasta.....	29,450	.32	.02	27,750	.28	.02	8.19	32,525	.29	.02	17.21
Siskiyou.....	29,400	.31	.02	29,500	.30	.02	4.42	32,725	.30	.02	10.93
Trinity.....	4,075	.04	-----	3,350	.03	-----	7.20	3,550	.03	-----	5.97

* Estimated apportionment of county total for Riverside and San Bernardino between Areas 2 and 3.

Source: United States—From Bureau of Census Report, Series P-46, No. 7.

California—July 1, 1946, from midpoint of California Taxpayers Association estimates of January 1, 1946, and January 1, 1947.

California—1950 and 1955 from estimates of California State Reconstruction and Reemployment Commission.

Population Study as Basis for Projections

Table 63 gives estimates of population in California Aviation Areas and Counties as of July 1, 1946 and projected estimates of population totals for 1950 and 1955. This data is used as the basis for the ensuing aeronautical projections of Tables 68 and 73. Population totals for July 1, 1946 were included since 1946 was the base year for both air passenger and private airplane projections, and 1946 mid-year population data is sufficiently close to the May 1, 1946 tally of private airplane ownership for a statistically sound computation of per capita ownership as shown in Table 61.

The July 1, 1946 population data of Table 63 was derived from the mid-point of estimates of the California Taxpayers' Association for January 1, 1946 and January 1, 1947. These estimates, based largely on school registrations, are considered generally accurate except for the inclusion of a certain number of military personnel temporarily stationed in California.

The projected population totals for 1950 and 1955 were developed in the following manner. In November 1946 the State Reconstruction and Reemployment Commission issued a monograph called *Estimated Range for Population Growth in California to 1960*. This

study thoroughly examined the probable future excess of births over deaths and net immigration in the light of past trends and arrived at State and County population estimates for 1950 and 1960. High and low totals for each of these two years are listed in Table 9 of the study. The estimates were given with this possible range to satisfy both the possibility of good economic conditions, with high birth rate and high immigration, and the obverse. In Table 63 the predicted population totals for 1950 are the midpoint of this previous study's high and low totals for that year. It was felt that the actual future population totals would not differ significantly from this midpoint. The 1955 totals of Table 63 were derived from the midpoint of the established 1950 totals and the midpoint of the study's high and low estimates for 1960.

An examination of Table 63 shows that the Aviation Areas in 1946 ranked in population as follows: Los Angeles, San Francisco, San Diego, Fresno, Mid-Coastal, Stockton, Sacramento, Kern, Desert, Redwood Empire, Chico-Red Bluff, Shasta-Cascade, Modoc Plateau, and Inyo-Mono. It is predicted that this same ranking will obtain in 1950 and 1955 except that the Chico-Red Bluff Area and the Redwood Empire Area will change positions.

2. SCHEDULED AVIATION PROJECTION

Basis for Projection

Detailed data on the growth of scheduled air transport in the United States from 1926 to the present, with estimates for 1950 and 1955, are found in Table 64. These estimates of United States totals of passenger and commodity traffic which domestic airlines will handle are used later as a basis for projections for California and stations within the State. It is believed that the estimates listed—neither the highest nor lowest predictions that have been made—are consistent with historical growth, are mutually corroborative, and are possible of realization under conditions of ordinary economic development.

As early as 1942 the National Resources Planning Board forecast a passenger potential of 20,000,000 annually sometime between 1950 and 1960¹. The Air Traffic Control Division of the Civil Aeronautics Administration has predicted a total of 20,000,000 passengers for 1950. The Economic Department of United Airlines, Inc., regarding the future more optimistically, issued an estimate of over 63,000,000 passengers for about 1955. The Civil Aeronautics Administration believes that by 1955 there will be 20,000,000 air travelers a year². For the reasons stated above, this estimate of 16,000,000 passengers in 1950 and 20,000,000 in 1955 was adopted for the purposes of the present study.

There have been two principal national estimates of air mail volume. The National Resources Planning Board predicted a gross mail traffic of sixty-five to seventy million ton-miles sometime between 1950 and 1960, and the Curtiss-Wright Corporation believed the volume potential would reach eighty-seven million ton-miles in 1950. Both studies were based on similar assumptions but evidently differed in the allowance made for expanding national production in the future. It was considered advisable to convert these predictions into volume totals of 70,000,000 ton-miles of air mail in 1950 and 85,000,000 ton-miles in 1955.

It is still more difficult to arrive at a sound projection for air express and freight volume. The volume of commodity traffic depends, to a large degree, on the rates charged, and there is considerable difference of opinion as to how rapidly airline carriers will be able to lower rates. There is some indication that charges may decrease much more swiftly than the most optimistic forecasters deemed possible. The National Resources Planning Board estimated 550,000,000 ton-miles of commodity air traffic some time between 1950 and 1960, with a rate level of 18 cents per ton-mile. The Curtiss-Wright study concluded that 110,100,000 ton-miles of air cargo would be carried in 1950 if rates were 30 cents per ton-mile. Assuming a 30 cent rate, a figure already considered high, and choosing the policy of conservatism, the present study adopts estimates of a

¹ *Transportation and National Policy, 1942.*

² *Civil Aviation and the National Economy, 1945.*

TABLE 64
GROWTH OF SCHEDULED AIR TRANSPORT
(United States Domestic)
Annual Data

Year	Author- ized Route Miles All Services*	Num- ber of Oper- ators*	Aircraft in Service	Revenue Miles Flown		Fuel Consumed Gallons— Year	Available Seats		Passenger Seat-miles Flown	Passenger Fare Per Mile
				Annually	Daily Average		Ave.	Total		
1926	8,252	11	-----	4,258,771	11,668	Data				.12
1927	8,865	16	-----	5,779,863	15,835					.106
1928	15,590	31	268	10,400,239	28,416		Not			.11
1929	24,874	34	442	22,380,020	61,315					.12
1930	29,887	38	497	31,992,634	87,651				Available	.083
1931	30,451	35	490	42,755,417	117,138					.067
1932	28,550	29	456	45,606,354	124,608	19,643,964	6.58	3,000	300,037,897	.061
1933	27,812	21	408	48,771,563	133,621	21,776,156	7.59	3,100	370,126,435	.061
1934	28,084	22	417	40,955,396	112,207	18,786,587	8.85	3,700	362,546,746	.059
1935	28,267	23	356	55,380,353	151,727	27,065,717	10.34	3,700	572,546,530	.057
1936	28,874	21	272	63,777,226	174,255	30,392,923	10.67	2,900	680,708,230	.057
1937	31,084	17	282	66,071,507	181,018	33,606,770	12.53	3,500	828,188,184	.056
1938	35,492	18	253	69,668,827	190,873	37,218,743	13.63	3,400	949,421,755	.057
1939	35,213	17	265	82,571,523	226,223	46,554,856	14.63	3,900	1,207,869,577	.051
1940	41,054	16	358	108,800,436	297,269	64,906,284	16.52	5,900	1,797,329,431	.0506
1941	41,915	17	359	133,022,679	364,446	80,757,892	17.41	6,200	2,316,205,507	.0503
1942	36,442	16	179	110,102,860	301,652	68,030,246	17.60	3,200	1,937,672,755	.0527
1943	36,982	16	194	103,601,443	283,840	63,908,388	17.61	3,400	1,824,849,802	.0535
1944	40,392	16	279	142,234,034	388,618	88,143,732	17.53	4,900	2,492,893,507	.0514
1945	51,433	17	411	214,959,855	588,931	145,500,000	18.22	7,488	3,915,770,090	.0450
1946	†65,400	29	750	305,962,344	838,253	230,000,000	25.00	18,750	7,650,000,000	.045
1950 Est.	70,000	30	800	600,000,000	1,644,000	-----	30.75	20,000	*10,000,000,000	.04
1955 Est.	75,000	36	1,200	876,000,000	2,400,000	-----	33.75	27,000	†16,200,000,000	.03

Year	Revenue Passengers			Average Length Passenger Trip— Miles	Mail Ton- Miles	Express and Freight		Total Ton- Miles
	Number	Passenger Miles	Load Factor			Pounds	Ton- Miles	
1926	5,782	Data				3,555	995	-----
1927	8,661			Not		45,859	12,841	-----
1928	47,840				Available	210,404	58,913	-----
1929	140,581					249,634	69,898	-----
1930	329,943	73,092,678	-----	224	-----	359,523	100,666	-----
1931	413,366	92,604,866	-----	226	3,140,205	788,059	220,657	-----
1932	417,366	110,523,754	36.84	268	2,701,125	1,033,970	289,512	-----
1933	433,964	150,938,144	40.78	352	2,567,949	1,510,215	422,860	-----
1934	406,334	163,437,007	45.08	407	2,461,411	2,133,191	597,293	-----
1935	663,261	279,375,902	48.80	420	4,132,708	3,822,397	1,089,802	-----
1936	911,148	388,242,120	57.04	427	5,741,436	6,958,777	1,860,809	-----
1937	958,510	407,295,893	49.18	432	6,698,230	7,127,369	2,156,070	-----
1938	1,176,858	476,402,280	50.18	415	7,422,860	7,335,967	2,173,706	65,865,427
1939	1,717,090	677,672,955	56.10	400	8,584,891	9,514,229	2,705,614	86,867,448
1940	2,727,820	1,041,173,558	57.93	388	10,035,638	12,506,176	3,469,485	129,205,285
1941	3,768,892	1,369,584,231	59.13	367	12,900,405	19,209,671	5,242,529	168,718,934
1942	3,349,134	1,398,042,146	72.15	417	21,066,627	39,968,785	11,691,208	183,188,019
1943	3,351,537	1,606,119,468	88.01	476	35,927,042	57,543,591	15,117,925	218,461,606
1944	4,575,852	2,229,571,113	89.44	485	50,922,016	66,011,669	17,094,029	298,528,924
1945	7,383,025	3,452,687,355	88.17	468	64,955,466	83,024,000	22,632,618	432,857,000
1946	†12,036,240	5,884,595,976	75.00	450	32,000,000	-----	37,000,000	†750,000,000
1950 Est.	16,000,000	8,000,000,000	80.00	500	70,000,000	400,000,000	100,000,000	970,000,000
1955 Est.	20,000,000	13,000,000,000	80.00	650	85,000,000	2,400,000,000	600,000,000	1,985,000,000

* December 31st figure for year shown.

† Includes 11,525 route miles Feeder lines.

* Assuming 650 aircraft in passenger service and 500,000,000 revenue miles per year for same.

b Assuming 800 aircraft in passenger service and 600,000,000 revenue miles per year for same.

Source: 1929-45 CAA Statistical Handbook—1946 Air Transport Association from American Aviation—February 1, 1947.

freight and express potential of 100,000,000 ton-miles by 1950 and 600,000,000 ton-miles by 1955. These totals make due allowance for possible operations by contract carriers.

Table 65 compares the volume of domestic airline passenger miles with pullman car passenger miles from 1930 to the present, with estimates for 1955. Airline and pullman car traffic lend themselves readily to comparison as the fares and average length of trip are similar. Total travel in the United States doubled between 1925 and 1940 and there is no reason to expect any lessening of this increase in normal peace years. Although it is believed that airline passenger miles will jump to fifty percent of pullman car passenger miles in 1955, there will still be an impressive increase in pullman car passenger miles. This table confirms the soundness of the estimates given in Table 64.

TABLE 65

COMPARISON OF DOMESTIC AIRLINE PASSENGER MILES
WITH PULLMAN CAR PASSENGER MILES

Year	Pullman	Airline	Percent airline of pullman
1930.....	12,515,000,000	84,014,572	0.7
1931.....	9,892,000,000	106,442,375	1.1
1932.....	6,758,000,000	127,038,798	1.9
1933.....	6,141,986,577	173,492,119	2.8
1934.....	6,891,002,293	187,858,629	2.7
1935.....	7,146,269,648	313,905,508	4.4
1936.....	8,354,840,293	435,740,253	5.2
1937.....	9,170,428,451	476,603,165	5.2
1938.....	8,269,882,057	557,719,268	6.7
1939.....	8,485,399,123	749,787,096	8.8
1940.....	8,213,878,992	1,147,444,948	14.0
1941.....	10,070,589,061	1,491,734,671	14.8
1942.....	19,071,589,061	1,481,976,329	7.8
1943.....	25,891,465,679	1,642,596,640	6.3
1944.....	28,267,090,536	2,264,282,453	8.0
1945.....	27,275,788,000	3,500,102,000	12.8
1946 (thru Sept.)	16,948,733,000	4,400,257,000	25.9
1955 Estimate..	28,000,000,000	14,000,000,000	50.0

Includes airline and pullman revenue and nonrevenue passenger miles. In addition, pullman passenger miles include those on United States rail routes extending into Canada and Mexico.

Source: Airlines—CAA Statistical Handbook. Pullman cars—Bureau of Railway Economics, Association of American Railroads.

Table 66 gives an interesting comparison of air and rail leaders in passenger revenue for 1941 and 1946. Four airlines are included among the fifteen traffic companies leading in passenger revenue. One of these airlines held seventh position in both 1941 and 1946. Another climbed from eleventh to eighth place in the five year period. One rose from twentieth to tenth rank, and one from sixteenth to thirteenth. This tabulation shows both the importance of airline passenger service from a business point of view and the increasingly larger revenues from air passenger service compared with railroad passenger service.

TABLE 66
AIR AND RAIL LEADERS IN PASSENGER REVENUE

Rank 1946	Railroad or Airline	Passenger Revenue, Jan- uary-August, 1946	Rank 1941
1	Pennsylvania R.R.....	\$144,629,000	1
2	New York Central R.R.....	102,154,000	2
3	Santa Fe R.R.....	55,502,000	5
4	Southern Pacific R.R.....	51,215,000	4
5	Union Pacific R.R.....	46,748,000	6
6	New York-New Haven R.R.....	41,325,000	3
7	American Airlines.....	35,999,000	7
8	United Air Lines.....	31,061,000	11
9	Baltimore and Ohio R.R.....	26,126,000	10
10	Trans World Airlines.....	25,780,000	20
11	Southern R.R.....	24,914,000	9
12	Chicago and Northwestern R.R....	23,737,000	12
13	Eastern Air Lines.....	23,043,000	16
14	Illinois Central R.R.....	21,591,000	14
15	Rock Island R.R.....	21,210,000	17

Source: American Aviation—December 15, 1946, quoting CAA for airline and I. C. C. for railroad passenger revenues.

Probable Future Stature

Tables 67 and 68 depict the growth of scheduled air transport in California, with projected potentials for 1950 and 1955. The volume of on and off domestic passengers in the State increased from 249,157 in 1939 to 2,603,819 in 1946. It is estimated that in 1950 there will be 3,536,000 passengers, and in 1955 the total will rise to 5,136,000. The tables list similar projections for present and future stations in the State. It is believed that the anticipated traffic volume, large though it is, is soundly derived and possibly conservative. Airports in the State must make complete provision in their plans now for expansion and development to meet this future traffic demand. Inasmuch as these two tables are closely interrelated, it was considered expedient to discuss their statistical evolution together.

The first step in developing these potentials was to determine the probable total of passengers in California in 1950 and 1955. The relationship of California to United States estimated population totals was calculated percentagewise for 1939, 1945, 1950 and 1955. Starting with historical data and using simple proportion, the relationship of the California volume of passengers to the United States volume was ascertained for 1950 and 1955. This relationship was based on population increase alone. The relationship of historical data for 1939 and 1945 showed that there was an additional 1.24 percent increase not attributable to population increase. By interpolation for the time periods, this further increase was computed for 1950 and 1955. It was thus possible to estimate that the volume of California passengers in 1950 would be 11.05 percent of the United States total, and in 1955 would increase to 12.84 percent. The Civil Aeronautics Administration has predicted that the United States will have 32,000,000 on and off passengers in 1950, and 40,000,000 in 1955.

TABLE 67
GROWTH OF SCHEDULED AIR TRANSPORT—DOMESTIC REVENUE PASSENGERS ON AND OFF
For United States and California Stations—By Numbers and Percent

Revenue Passengers	1939	1945	1945 Ratio to 1939	1946	1946 Ratio to 1945	(Estimated) 1950	1950 Ratio to 1946	(Estimated) 1955	1955 Ratio to 1950
United States Total.....	1,876,051	7,502,738	4.00	12,036,240	1.60	16,000,000	1.33	20,000,000	1.25
On and Off United States..	3,752,102	15,005,476	4.00	24,072,480	1.60	32,000,000	1.33	40,000,000	1.25
California.....	249,157	1,437,749	5.77	2,593,845	1.80	3,536,000	1.36	5,136,000	1.45
Percent United States....	6.64	9.58	-----	10.78	-----	11.05	-----	12.84	-----
Los Angeles.....	124,736	761,452	6.10	1,370,080	1.80	†1,294,017	.94	†1,905,480	1.47
Percent California.....	50.06	52.96	-----	52.82	-----	36.59	-----	37.10	-----
Percent United States....	3.33	5.07	-----	5.69	-----	4.04	-----	4.76	-----
San Francisco.....	64,176	442,968	6.90	834,360	1.88	†783,842	.94	†1,109,804	1.42
Percent California.....	25.76	30.81	-----	32.17	-----	22.17	-----	21.61	-----
Percent United States....	1.71	2.95	-----	3.47	-----	2.45	-----	2.78	-----
San Diego.....	20,000	113,641	5.68	155,959	1.37	202,259	1.30	296,861	1.47
Percent California.....	8.03	7.90	-----	6.01	-----	5.72	-----	5.78	-----
Percent United States....	.53	.76	-----	.65	-----	.63	-----	.74	-----
Oakland.....	25,263	49,087	1.94	90,804	1.85	85,307	.94	120,782	1.42
Percent California.....	10.14	3.41	-----	3.50	-----	2.41	-----	2.35	-----
Percent United States....	.67	.33	-----	.38	-----	.27	-----	.30	-----
Fresno.....	3,613	14,129	3.91	23,256	1.65	31,117	1.34	45,197	1.45
Percent California.....	1.45	.98	-----	.90	-----	.88	-----	.88	-----
Percent United States....	.10	.09	-----	.10	-----	.10	-----	.11	-----
Sacramento.....	5,700	19,800	3.47	56,738	2.87	59,405	1.05	86,285	1.45
Percent California.....	2.29	1.38	-----	2.19	-----	1.68	-----	1.68	-----
Percent United States....	.15	.13	-----	.23	-----	.18	-----	.22	-----
Del Monte.....	1,000	3,938	3.94	6,268	1.59	5,658	.90	8,732	1.54
Percent California.....	.40	.27	-----	.24	-----	.16	-----	.17	-----
Percent United States....	.03	.03	-----	.03	-----	.02	-----	.02	-----
Bakersfield.....	1,635	3,018	1.85	12,927	4.28	16,266	1.26	23,626	1.45
Percent California.....	.65	.21	-----	.50	-----	.46	-----	.46	-----
Percent United States....	.04	.02	-----	.05	-----	.05	-----	.06	-----
Santa Barbara.....	1,800	*4,000	2.22	*8,000	2.00	9,194	1.15	13,867	1.51
Percent California.....	.72	.29	-----	.31	-----	.26	-----	.27	-----
Percent United States....	.05	.03	-----	.03	-----	.03	-----	.03	-----
Long Beach.....	1,234	21,216	17.19	25,453	1.20	28,915	1.14	42,578	1.47
Percent California.....	.50	1.48	-----	.98	-----	.82	-----	.83	-----
Percent United States....	.03	.14	-----	.11	-----	.09	-----	.11	-----
Other Stations.....	-----	*4,500	-----	*10,000	2.22	1,020,020	10.20	1,482,788	1.45
Percent California.....	-----	.31	-----	.38	-----	28.85	-----	28.87	-----
Percent United States....	-----	.03	-----	.04	-----	3.19	-----	3.71	-----
United States Population..	130,400,000	139,637,406	1.07	141,000,000	1.01	145,500,000	1.03	150,000,000	1.03
California Population.....	6,755,000	9,083,500	1.34	9,250,000	1.02	9,935,000	1.07	11,117,500	1.12
Percent United States....	5.18	6.51	-----	6.56	-----	6.83	-----	7.41	-----

* Estimated.

† Indicates actual passenger traffic generated or terminated at these points; does not reflect feeder line or transfer passengers.

Applying the preceding percentages this would give California 3,536,000 passengers in 1950 and 5,136,000 in 1955. A summary of the mathematical processes used follows:

**COMPARISON OF VOLUME OF AIRLINE PASSENGERS
IN CALIFORNIA AND THE UNITED STATES**

	1939	1945	1950	1955
Percent California Population of the United States-----	5.18	6.51	6.83	7.41
Percent Volume of California Airplane Passengers of United States Volume, Based on Population Increase-----	6.64	8.34	8.76	9.50
Percent Volume Increase Not Attributable to Population Increase -----		1.24	2.29	3.34
Percent Actual Volume of California Airplane Passengers of United States Volume----	6.64	9.58	11.05	12.84

Table 68 lists the population within a twenty-five mile radius of the California stations for 1946, 1950 and 1955. It was considered a reasonable assumption that a circle of this radius would include most of the passenger potential of a given airport. The population totals for 1946 were carefully compiled by applying estimated percentages of increase to the 1940 census totals of population for the judicial township or portions of judicial townships included within the twenty-five mile radii. Percentages of population increase to 1950 and 1955, derived from Table 63, are given as Factors "A" and "B" respectively. The 1946 population within the twenty-five mile radii was increased by these percentages to arrive at the 1950 and 1955 populations of the immediate passenger markets.

The volume of passengers in 1946 was compiled from data furnished by the various commercial airlines. In certain cases noted on Table 68 partial year totals were converted into annual totals to reach a normal base year. Passenger interest represents basically the relationship of passenger volume in 1946 to the total population within each twenty-five mile radius passenger market. At this point, however, it was necessary to make certain arbitrary adjustments, either because data for a base year was lacking or because service engendered during a few months could scarcely be regarded as normal service for the station. In some instances it was considered fairer to assign to the entire Area the passenger interest computed for one established station which was believed typical. In Areas which had no passengers in 1946 because no airports existed with scheduled flying, an arbitrary passenger interest was adopted, based on a comparison with other Areas with similar economic and transportation factors.

The next step was applying these passenger interest percentages to the estimated interested population totals for 1950 and 1955. This resulted in the two columns headed "Composite Population Passenger Interest". The total of this factor for each station was then related to the State total and the resulting percentages, applied to the State total passenger potentials for 1950 and 1955 previously calculated, gave a passenger potential total for each probable airport station in the State for 1950 and 1955.

No attempt was made to distribute the passenger potential among Avalon, Burbank, Long Beach and Los Angeles, or between San Francisco and Oakland, because such an allotment would have to be based on some other criterion than the population within a twenty-five mile radius used in the present development.

**TABLE 68
PROJECTED AIR TRANSPORT FOR CALIFORNIA—DOMESTIC REVENUE PASSENGERS ON AND OFF—1950 AND 1955**

Aviation Area and Station	1946			1950					1955				
	Population within 25 Mile Radius	Volume of Passengers	Passenger Interest	Factor "A"	Population within 25 Mile Radius	Composite Population Passenger Interest	Per Cent State Total	Passenger Potential	Factor "B"	Population within 25 Mile Radius	Composite Population Passenger Interest	Per Cent State Total	Passenger Potential
United States-----		24,072,480						32,000,000					40,000,000
California-----	5,918,100	2,603,819	43.95	9.37	9,935,000	2,958,115	100.00	3,536,000	11.90	11,117,500	3,306,017	100.00	5,136,000
Area 1. San Diego-----	437,000	155,959	35.69	8.51	474,189	169,238	5.72	202,259	12.84	535,075	190,968	5.78	296,861
Area 2. Los Angeles Metropolitan-----	3,244,000	1,395,533	43.02	10.90	3,597,596	1,547,686	52.32	1,850,035	13.30	4,076,076	1,753,528	53.04	2,724,134
Avalon-----													
Burbank-----		233,205											
Long Beach-----		25,453											
Los Angeles-----	2,786,000	1,136,875	50.09		3,089,674	1,329,178	44.93	1,588,725		3,500,601	1,505,959	45.55	2,339,448
Riverside-San Bernardino-----	290,000				321,610	138,357	4.68	165,485		364,384	156,758	4.74	243,446
Santa Ana-----	168,000				186,312	80,151	2.71	95,825		211,091	90,811	2.75	141,240
Area 3. Desert-----	77,000		43.02	8.73	83,722	36,017	1.22	43,139	13.47	94,999	40,869	1.24	63,686
El Centro-----	51,000				55,452	23,855	.81	28,642		62,921	27,069	.82	42,115
Palm Springs-----	26,000				28,270	12,162	.41	14,497		32,078	13,800	.42	21,571

TABLE 68—Continued

PROJECTED AIR TRANSPORT FOR CALIFORNIA—DOMESTIC REVENUE PASSENGERS ON AND OFF—1950 AND 1955

Aviation Area and Station	1946			Factor "A"	1950				Factor "B"	1955			
	Population within 25 Mile Radius	Volume of Passengers	Passenger Interest		Population within 25 Mile Radius	Composite Population Passenger Interest	Per Cent State Total	Passenger Potential		Population within 25 Mile Radius	Composite Population Passenger Interest	Per Cent State Total	Passenger Potential
Area 4. Kern.....	139,000	12,927	9.79	6.37	147,554	14,475	.49	17,326	12.82	166,809	16,331	.49	25,166
Bakersfield.....	132,000	12,927	9.79	-----	140,408	13,746	.46	16,266	-----	158,408	15,508	.46	23,626
Mojave.....	7,000	-----	-----	-----	7,446	729	.03	1,060	-----	8,401	823	.03	1,540
Area 5.....	377,000	19,162	12.05	11.39	419,940	50,603	1.71	60,466	13.31	475,834	57,338	1.73	88,353
Monterey.....	36,000	6,268	17.41	-----	40,100	4,832	.16	5,658	-----	45,437	5,475	.17	8,732
Oxnard-Ventura.....	83,000	-----	-----	-----	92,454	11,141	.38	13,437	-----	104,760	12,624	.38	19,517
Salinas.....	65,000	4,894	7.53	-----	72,404	8,725	.30	10,608	-----	82,041	9,886	.30	15,408
San Luis Obispo.....	27,000	-----	-----	-----	30,075	3,624	.12	4,243	-----	34,078	4,106	.12	6,163
Santa Barbara.....	58,000	8,000	13.79	-----	64,606	7,785	.26	9,194	-----	73,205	8,821	.27	13,867
Santa Cruz.....	81,000	-----	-----	-----	90,226	10,872	.37	13,083	-----	102,235	12,319	.37	19,003
Santa Maria.....	27,000	-----	-----	-----	30,075	3,624	.12	4,243	-----	34,078	4,107	.12	6,163
Area 6.....	453,000	24,528	10.67	11.38	504,551	53,836	1.82	64,355	12.60	568,124	60,619	1.83	93,989
Coalinga.....	10,000	-----	-----	-----	11,138	1,188	.04	1,414	-----	12,541	1,338	.04	2,054
Fresno.....	218,000	23,256	10.67	-----	242,808	25,908	.88	31,117	-----	273,402	29,172	.88	45,197
Visalia-Tulare.....	225,000	1,272	.57	-----	250,605	26,740	.90	31,824	-----	282,181	30,109	.91	46,738
Area 7.....	8,100	-----	35.00	6.36	8,615	3,015	.10	3,536	10.90	9,554	3,344	.10	5,136
Bishop.....	4,500	-----	-----	-----	4,786	1,675	.06	2,122	-----	5,308	1,858	.06	3,082
Manzanar.....	3,600	-----	-----	-----	3,829	1,340	.04	1,414	-----	4,246	1,486	.04	2,054
Area 8.....	375,000	7,716	2.06	11.83	419,363	8,639	.29	10,255	12.52	471,867	9,720	.29	14,894
Merced.....	52,000	2,988	-----	-----	58,152	1,198	.04	1,415	-----	65,433	1,348	.04	2,054
Modesto.....	117,000	2,508	-----	-----	130,841	2,695	.09	3,182	-----	147,222	3,032	.09	4,622
Stockton.....	206,000	2,220	-----	-----	230,370	4,746	.16	5,658	-----	259,212	5,340	.16	8,218
Area 9.....	2,530,000	925,164	36.57	6.06	2,683,318	981,239	33.17	1,172,891	8.94	2,923,207	1,069,017	32.34	1,660,983
Oakland.....	1,875,000	90,804	-----	-----	1,988,625	727,240	24.58	869,149	-----	2,166,408	792,255	23.96	1,230,586
San Francisco.....	-----	834,360	49.34	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
San Jose.....	246,000	-----	-----	-----	260,908	95,414	3.22	113,859	-----	284,233	103,944	3.15	161,784
Santa Rosa.....	79,000	-----	-----	-----	83,787	30,641	1.04	36,774	-----	91,278	33,381	1.01	51,874
Vallejo.....	330,000	-----	-----	-----	349,998	127,994	4.33	153,109	-----	381,288	139,437	4.22	216,739
Area 10.....	325,000	56,738	17.46	10.67	359,678	62,800	2.12	74,963	11.88	402,408	70,260	2.13	109,397
Marysville.....	68,000	-----	-----	-----	75,256	13,140	.44	15,558	-----	84,197	14,701	.45	23,112
Sacramento.....	257,000	56,738	22.08	-----	284,422	49,660	1.68	59,405	-----	318,211	55,559	1.68	86,285
Area 11.....	86,000	3,876	8.43	4.25	89,655	7,558	.26	9,194	6.13	95,151	8,021	.24	12,327
Crescent City.....	4,000	-----	-----	-----	4,170	351	.01	354	-----	4,426	373	.01	514
Eureka.....	46,000	3,876	8.43	-----	47,955	4,043	.14	4,951	-----	50,894	4,290	.13	6,677
Fort Bragg.....	12,000	-----	-----	-----	12,510	1,055	.04	1,414	-----	13,277	1,119	.03	1,541
Ukiah.....	24,000	-----	-----	-----	25,020	2,109	.07	2,475	-----	26,554	2,238	.07	3,595
Area 12.....	71,000	2,216	15.83	14.27	81,132	12,843	.44	15,558	13.57	92,142	14,586	.44	22,598
Chico.....	57,000	-----	-----	-----	65,134	10,311	.35	12,376	-----	73,973	11,710	.35	17,976
Red Bluff.....	14,000	2,216	15.83	-----	15,998	2,532	.09	3,182	-----	18,169	2,876	.09	4,622
Area 13.....	27,000	-----	8.43	4.48	28,210	2,378	.08	2,829	10.66	31,217	2,631	.08	4,109
Alturas.....	7,000	-----	-----	-----	7,314	616	.02	707	-----	8,094	682	.02	1,027
Susanville.....	20,000	-----	-----	-----	20,896	1,762	.06	2,122	-----	23,124	1,949	.06	3,082
Area 14.....	46,000	-----	15.83	6.27	48,884	7,738	.26	9,194	13.53	55,498	8,785	.27	13,867
Dunsmuir.....	15,000	-----	-----	-----	15,941	2,523	.08	2,829	-----	18,098	2,865	.09	4,622
Redding.....	19,000	-----	-----	-----	20,191	3,196	.11	3,890	-----	22,923	3,629	.11	5,650
Yreka.....	12,000	-----	-----	-----	12,752	2,019	.07	2,475	-----	14,477	2,291	.07	3,595

Factor "A" is the percent of increase in the 1950 area population over the 1946 figure—Table 63.

Factor "B" is the percent of increase in the 1955 area population over the 1950 figure—Table 63.

¹ Annual total computed from total for one month.

² Annual total computed from total for five months.

³ Annual total computed from total for six months.

Note: The total volume of passengers in 1946 is greater here than in Table 67 because the sum of the additional stations is greater than the 10,000 estimate of Table 67.

The 1950 and 1955 passenger potential of Los Angeles plus Long Beach of Table 67 is less than the Los Angeles metropolitan area given above because the latter includes Burbank and Avalon.

Certain apparent differences in Tables 67 and 68 require reconciliation. The State total of passengers given in Table 68 is greater than that of Table 67 because the sum of certain stations with passenger volume expanded to reach a normal base year for the projections is greater than the 10,000 passengers allowed for "Other Stations" in Table 67 as an historical fact. The passenger potential of the Los Angeles Metropolitan Area, shown in Table 68, is greater than the potential of Los Angeles and Long Beach of Table 67 because Table 68 makes allowance for passenger development in Burbank and Avalon.

Certain interesting conclusions can be drawn from the air passenger volumes shown in Table 68. In 1946, as well as in the estimates for 1950 and 1955, the six leading Aviation Areas in volume of passengers are the Los Angeles, San Francisco, San Diego, Sacramento

and Fresno Metropolitan Areas, and then the Mid Coastal Area. In 1946 Areas 4 (Kern), 8 (Stockton), 11 (Redwood Empire), and 12 (Chico-Red Bluff) followed in order of ranking. In the 1950 estimates the other Areas in order were 3 (Desert), 4 (Kern), 12 (Chico-Red Bluff), 8 (Stockton), 11 (Redwood Empire) and 14 (Shasta Cascade) tying, 7 (Inyo-Mono) and 13 (Modoc Plateau). In the 1955 predictions the same ranking prevails except that Area 14 (Modoc Plateau) leads Area 11 (Redwood Empire). The addition of more stops will change the passenger volume picture of the State considerably. Sizeable passenger traffic will develop in hitherto unserved Areas. Certain stations will experience a lesser expansion than anticipated because of the competition of new, close lying stops.

3. NON-SCHEDULED AVIATION PROJECTION

Basis for Projection

Table 69 lists annual data on the growth of non-scheduled flying in the United States from 1926 to the present. Although the number of airplanes used in scheduled airline service is large, it is greatly exceeded

by the number in non-scheduled operations. In 1945 the ratio was 56 to 1. Between 1927 and 1945 the total aircraft engaged in non-scheduled flying increased fourteen-fold. The method of developing the potential volume required in 1950 and 1955 will be discussed later.

TABLE 69
GROWTH OF NONSCHEDULED FLYING IN THE UNITED STATES
ANNUAL DATA

Calendar Year	Aircraft in Operation Dec. 31	Passengers			Miles Flown	Fuel Used Gallons-Year
		Total	Revenue	Nonrevenue		
1926		771,010	676,657	94,353	18,746,640	2,426,028
1927	2,612				30,000,000	3,882,351
1928	4,779				60,000,000	7,764,702
1929	9,315	2,189,431	1,732,752	456,679	110,000,000	14,235,243
1930	9,218	2,298,341	1,840,492	457,849	108,269,760	13,981,331
1931	10,090	1,867,517	1,430,052	437,465	94,343,115	11,658,009
1932	9,760	1,255,809	879,225	376,584	78,178,700	10,293,599
1933	8,780	1,246,134	906,970	339,164	71,222,845	8,861,104
1934	7,752	1,397,288	1,044,079	353,209	75,602,152	9,630,869
1935	8,613	1,287,375	1,014,957	272,418	84,755,630	11,104,259
1936	8,849	1,466,058	1,215,405	250,653	93,320,375	10,451,496
1937	10,446	1,580,412	1,295,904	284,508	103,196,355	10,618,240
1938	10,718	1,575,151	1,238,133	337,018	129,359,095	10,201,053
1939	13,217	1,594,086	1,161,292	432,794	177,868,157	16,394,335
1940	17,253	1,600,000	1,175,000	425,000	264,000,000	22,400,000
1941	24,124	Data not available	Data not available	Data not available	346,303,400	29,300,000
1942	26,000				293,592,580	24,900,000
1943	26,000					
1944	27,200					
1945	36,000					
1946	*84,000	(CAA Estimate)			*1,260,000,000	*125,000,000
1950	*187,000				*2,790,000,000	*279,000,000
1955	*400,000	(CAA Estimate)			*6,000,000,000	*600,000,000

* Estimate.

Source: CAA Statistical Handbook and CAA Journal, January 15, 1947.

TABLE 70
INCREASE IN CIVIL AIRCRAFT
1927 Through 1946

California			As of December 31st	United States			California Percent United States
Certificated	Uncertificated	Total		Certificated	Uncertificated	Total	
Not available.....	Not available	Not available	1927	1,908	832	2,740	-----
Not available.....	Not available	Not available	1928	3,165	1,939	5,104	-----
832.....	390	1,222	1929	6,803	3,119	9,922	11.31
993.....	182	1,175	1930	7,354	2,464	9,818	11.97
959.....	227	1,186	1931	7,553	3,127	10,680	11.10
921.....	213	1,134	1932	7,330	2,994	10,324	10.94
870.....	160	1,030	1933	6,896	2,388	9,284	11.09
766.....	131	897	1934	6,339	1,983	8,322	10.78
831.....	103	934	1935	7,371	1,701	9,072	10.30
840.....	116	956	1936	7,424	1,805	9,229	10.36
1,110.....	109	1,219	1937	9,152	1,684	10,836	11.25
1,107.....	72	1,179	1938	10,000	1,159	11,159	10.57
1,281.....	63	1,344	1939	12,829	943	13,772	9.76
1,753.....	93	1,846	1940	17,351	577	17,928	10.30
Data not available for war years	Data not available for war years	Data not available for war years	1941	24,836	0	24,836	-----
			1942	22,904	0	22,904	-----
			1943	22,927	0	22,927	-----
			1944	21,893	0	21,893	-----
			1945	37,789	0	37,789	-----
6,539.....	0	6,539	July 1, 1946	57,488	0	57,488	11.37
7,200.....	0	7,200	Oct. 15, 1946	71,982	0	71,982	10.00
8,400.....	0	8,400	1946	84,000	0	84,000	10.00
			Estimates				
19,100.....	0	19,100	1950	187,000	0	187,000	10.21
44,400.....	0	44,400	1955	400,000	0	400,000	11.10

Source: United States, 1927—July 1, 1946—CAA Statistical Handbook.
California, 1929-40—CAA bulletins.
California, July 1, 1946—CAA Statistical Handbook.
United States and California, October 15, 1946—CAA Santa Monica Office.

United States, 1946—December 31st—CAA Release No. CAA 113 of December 29, 1946.
Estimate—United States, 1955—CAA Civil Aviation and the National Economy.

Data showing the increase in civil aircraft in California and the United States from 1927 through 1946 is given in Table 70. The annual totals of civil aircraft in the United States shown here are somewhat larger than the comparable totals of Table 69 because the present figures cover all civil aircraft, including those not being flown in non-scheduled operations. This data makes obvious two striking conclusions. Between 1929 and the end of 1946, the number of civil airplanes in California increased 435 percent; during this same period the total in the United States increased 479 percent. Stating this another way, the California total each year has varied only slightly from 10 percent of the National total. It will be noted that this relationship holds true for the 1950 and 1955 projections. There is good reason for referring to California aeronautically as "The Ten Percent State."

The rising interest in civil aviation is made manifest by the increase in civil pilot and student certificates given in Tables 71 and 72, respectively. Certificates for airline transport, commercial, solo and private pilots in the United States as a whole totalled 10,215 in 1929. By 1946 these certificates numbered 400,000, nearly 40 times more. Between these same years, student "tickets" rose from 20,400 to 170,000. In California there were 2,076 persons with pilot cer-

tificates in 1929; by the middle of 1945 this total had increased to 16,659.

Several interesting surveys, approaching the problem from different viewpoints, have been made of the potential private airplane market in the United States. The Crowell-Collier Research Report, "*Tomorrow's Customers for Aviation*," was based on sampling, and concluded that one million urban families actually expect to buy an airplane within the next ten years. Another study, prepared by Victor Perlo for the Civil Aeronautics Administration, examined projected airplane purchases by persons in the medium and high income brackets. This report indicated that under conditions of full employment there could be a total registration of 1,120,000 family sized aircraft by 1955. A third survey, *The Post-War Plans of Kansas Families*, made in 1944-45 by Dr. F. L. Whan of the University of Wichita, arrived at percentages of Kansas urban, rural non-farm, and rural farm families which had definite plans to purchase airplanes. When Dr. Whan's percentages are applied to 1940 census figures, it appears that the national potential in 1955 would be 1,049,000 airplanes, and the California potential 52,612. These surveys agree roughly in postulating a private aircraft potential of one per 150 individuals. This would appear above reasonable expectancy. The

CALIFORNIA AIRPORTS

TABLE 71
INCREASE IN CIVIL PILOTS
1929 Through 1946

California				As of December 31st	United States				California Percent United States
Airline Transport	Commer- cial	Private and Solo	Total		Airline Transport	Commer- cial	Private and Solo	Total	
1-----	1,100	976	2,076	1929	1	6,053	4,162	10,215	20.32
1-----	1,267	1,585	2,852	1930	1	7,847	7,433	15,280	18.66
1-----	1,370	1,957	3,327	1931	1	8,513	9,226	17,739	18.76
2-----	1,328	2,247	3,775	1932	330	7,967	10,297	18,594	20.30
2-----	1,316	1,306	2,622	1933	554	7,635	5,771	13,960	18.78
2-----	1,280	1,258	2,538	1934	676	7,484	5,789	13,949	18.19
2-----	1,226	1,385	2,611	1935	736	7,362	6,707	14,805	17.64
2-----	1,326	1,702	3,028	1936	842	7,288	7,822	15,952	18.98
2-----	1,373	2,000	3,373	1937	1,064	6,411	10,206	17,681	19.08
157-----	1,303	2,747	4,207	1938	1,159	7,839	13,985	22,983	18.30
162-----	1,265	3,766	5,193	1939	1,197	8,280	21,787	31,264	16.61
176-----	1,428	6,681	8,285	1940	1,431	10,151	51,531	63,113	13.13
Data not available for war years	Data not available for war years	Data not available for war years	Data not available for war years	1941	1,587	15,429	83,771	100,787	-----
				1942	2,177	18,808	89,525	110,510	-----
				1943	2,315	20,587	99,982	122,884	-----
				1944	3,046	22,059	107,327	132,432	-----

381-----	4,194	12,084	16,659	1945*	3,141	30,085	108,054	141,280	11.79
-----				1945	-----	-----	-----	*296,895	-----
-----				1946	-----	-----	-----	*400,000	-----

* As of July 1, 1945.

¹ Airline transport certificates not issued prior to 1932.² Airline transport certificates not segregated by states.³ CAA Release No. CAA 113 of December 29, 1946.

Source: CAA Statistical Handbook and CAA bulletins.

TABLE 72
INCREASE IN STUDENT CERTIFICATES ISSUED PER YEAR
1927-1946—UNITED STATES

1927-----	545	1937-----	21,770
1928-----	9,717	1938-----	15,556
1929-----	20,400	1939-----	29,839 (CPT)
1930-----	18,398	1940-----	110,938 (CPT)
1931-----	16,061	1941-----	93,366 (CPT)
1932-----	11,325	1942-----	93,777 (CPT)
1933-----	12,752	1943-----	36,802
1934-----	11,994	1944-----	51,276
1935-----	14,572	1945-----	77,188 (G. I. Prog.)
1936-----	17,675	1946-----	170,000 (G. I. Prog.)

Source: 1927-1944 CAA Statistical Handbook.

1945-1946 CAA Release No. CAA 113 of December 29, 1946.

potential ultimately developed in the present study of 44,400 airplanes for California in 1955 represents one airplane for each 250 people.

Another possible approach to the projection of private plane ownership was outlined in the Civil Aeronautics Administration Manual, *Airport Planning for Urban Areas*. This method advised applying certain indices to the totals of families in medium and high income brackets as determined from 1940 census figures. When applied to Los Angeles County, this procedure resulted in a potential below the present airplane own-

ership. It was concluded, therefore, that while this method might be feasible for more congested eastern districts, it was not applicable to California where greater distances, better flying conditions and a wide dispersion of wealth raise the potential of future aircraft ownership.

The method finally developed and applied in determining private airplane ownership potentials for California, its Aviation Areas and Counties, as given in Table 73, will now be discussed in detail.

Probable Future Development

The first step in developing a private airplane potential was to ascertain the most probable national and State total ownership in 1950 and 1955. In 1946 most manufacturers and distributors were confident that aircraft ownership would increase at the rate of 35 percent annually for the next ten years. This would result in national totals of 166,000 in 1950 and 745,000 in 1955, and State totals of 19,800 in 1950 and 89,000 in 1955. Latest estimates of the Civil Aeronautics Board, much more conservative than the preceding, predict 150,000 private airplanes by 1950 and 400,000 by 1955 for the entire country. By applying 12 percent, a possible relationship of the State and national totals, these figures are translated into State totals of 18,000 for 1950 and 48,000 for 1955. Making use of the latest data available, these estimates are revised for purposes of the present study to a national potential of 187,000 private aircraft in 1950 and 400,000 in 1955, and a State potential of 19,100 in 1950 and 44,400 in 1955.

These totals for 1950 and 1955 were calculated in the following manner. On December 31, 1946, California had 6.68 percent of the Nation's total population and 10 percent of the total private planes (Table 70). The best available estimates demonstrate that California's proportion of the national population will increase to 6.83 percent by 1950 and 7.41 percent by 1955 (Table 63). Applying a similar increase to the present 10 percent share of aircraft, it is anticipated that 10.21 percent of all private airplanes in the country will be located in California in 1950 and 11.10 percent in 1955. The Civil Aeronautics Administration's estimate of a national potential plane ownership of 400,000 in 1955 appears sound, and on the conservative side. Taking 11.10 percent of this total, it can be expected that California will have 44,400 aircraft in 1955. Starting with a year end count of 7,200 airplanes in 1946, and an estimate of 44,400 for 1955, it was possible by interpolation to postulate an increase of 300 percent from 1946 to 1950 and an increase of 267 percent from 1950 to 1955. The results indicate a State ownership of 19,100 private aircraft in 1950. As estimated above, the State total in 1950 will be 10.21 percent of the national total; hence, national ownership in 1950 should reach 187,000 airplanes. These State and national totals are listed in Tables 69 and 70, and the State totals are repeated in Table 73, where they are prorated to the various Areas and Counties in the following manner:

The aircraft potential owner index, as found in Column 3 of Table 73, is the simple arithmetic mean of two indexes previously developed. The present ownership index is taken from Column 4 of Table 61. As will be recalled, this index resulted from proportioning

the number of aircraft registrations by count on May 1, 1946 per 10,000 people to the State average. This index is therefore an exact reflection of actual present ownership. The economic index from Column 7 of Table 45, was developed, as explained in Section 6 of Part III, from five selected economic factors, for the purpose of accurately portraying the ability of the local population to buy private aircraft. It is posited that the combination of a measure of past buying of aircraft—eventuating from such factors as local interest in aviation, following the lead of neighbors, and available airport facilities—and a measure of the ability to buy—based on evidences of residual wealth, current income, and general habit of spending—furnishes a good yardstick to measure future airplane buying.

Continuing the reference to Table 73, the statistical buying units for each County (Column 5), are the products of the aircraft potential ownership index and the population estimate for 1950 from Table 63. The County and Area percentages of the total State units, as shown in Column 6 were applied percentagewise to the estimated State total of private airplanes in 1950 to arrive at a private airplane potential for each Area and County, as shown in Column 7 of Table 73. The same process was followed *mutatis mutandis* in developing the Area and County potentials for 1955, shown in Column 11.

It is believed that these private airplane potentials, based on proved interest in aircraft ownership and ability to buy, are a sound indication of possible future aircraft ownership in the various Areas and Counties. As with any such projection the results might be vitiated by some unforeseen aeronautical advance or economic setback, but the remote possibility of such eventuality does not weaken the statistical reasoning pertinent to these estimates.

A comparison of the relative position of the Areas in respect to the total of aircraft owned May 1, 1946 and the totals which may be owned in 1950 and 1955 shows certain interesting reversals in rank. This tends to demonstrate that some Areas have less airplanes than their ability to buy and that varying increases in population will be reflected in changes of airplane market potentials. On May 1, 1946 the Areas ranked as follows, in order to total airplane ownership: Los Angeles, San Francisco Bay, San Diego, Fresno, Mid Coastal, Sacramento, Stockton, Chico-Red Bluff, Desert, Kern County, Modoc Plateau, Inyo-Mono and Shasta Cascade tying, and Redwood Empire. It is estimated that in 1950 the order will be: Los Angeles, San Francisco, San Diego, Fresno, Mid Coastal, Sacramento, Stockton, Kern County, Desert and Chico-Red Bluff tying, Modoc Plateau, Redwood Empire, Shasta Cascade, and Inyo-Mono. In 1955 the estimates show the same order except that Fresno goes ahead of the Mid Coastal Area and the Desert Area leads the Chico-Red Bluff Area.

TABLE 73
CALIFORNIA AIRCRAFT OWNERSHIP PROJECTION—BY AREAS AND COUNTIES—1950 AND 1955

Area County	Indices			1950 Projection				1955 Projection			
	Present Ownership Column 4 Table 61	Economic Column 7 Table 45	Aircraft Potential Owner- Ship	Population Estimate Table 63	Statistical Buying Units	Percent of State Buying Units	Potential Aircraft For Planning	Population Estimate, Table 63	Statistical Buying Units	Percent of State Buying Units	Potential Aircraft For Planning
Column	1	2	3	4	5	6	7	8	9	10	11
California.....	100	100	100	9,935,000	9,915,513	100.00	19,100	11,117,500	11,127,943	100.00	44,400
Area 1. San Diego.....	144	94	119	514,900	612,731	6.18	1,180	581,000	691,390	6.21	2,757
Area 2. Los Angeles Metropolitan.....	122	98	110	4,434,442	4,873,432	49.15	9,388	5,024,350	5,521,750	49.62	22,031
Los Angeles.....	120	100	110	3,921,850	4,312,382	43.51	8,310	4,444,075	4,886,612	43.93	19,505
Orange.....	143	99	121	186,750	225,881	2.26	432	211,350	255,636	2.28	1,012
West Riverside.....	167	74	120	111,562	133,823	1.35	258	126,375	151,592	1.36	604
S.W. San Bernardino.....	110	79	94	214,280	201,346	2.03	388	242,550	227,910	2.05	910
Area 3. Desert.....	150	87	119	126,158	151,799	1.53	292	143,150	172,291	1.55	688
Imperial.....	172	98	135	59,750	82,012	.81	155	67,950	93,263	.82	364
Riverside.....	159	74	117	37,188	44,238	.45	86	42,125	50,108	.45	200
San Bernardino.....	93	79	86	29,220	25,549	.27	51	33,075	28,920	.28	124
Area 4. Kern.....	92	114	103	197,400	203,322	2.05	392	222,700	229,381	2.06	915
Area 5.....	126	105	116	421,500	493,558	4.98	951	477,600	559,433	5.03	2,233
Monterey.....	115	101	108	106,500	115,951	1.16	222	120,500	131,204	1.17	519
San Benito.....	13	96	55	13,700	7,596	.08	15	15,600	8,650	.08	36
San Luis Obispo.....	106	92	99	47,800	47,705	.48	92	53,900	53,797	.48	213
Santa Barbara.....	172	125	140	95,500	142,484	1.42	271	107,500	160,401	1.43	635
Santa Cruz.....	40	87	64	58,950	38,033	.38	72	66,700	43,037	.38	169
Ventura.....	176	108	142	99,050	141,789	1.46	279	113,400	162,344	1.49	661
Area 6.....	114	99	107	460,850	494,890	4.99	953	518,900	557,282	5.01	2,225
Fresno.....	106	105	106	240,200	254,612	2.57	491	270,600	286,836	2.58	1,146
Kings.....	108	128	118	45,700	53,926	.54	103	51,450	60,711	.55	244
Madera.....	35	86	61	32,750	19,978	.20	38	36,750	22,418	.20	89
Tulare.....	147	86	117	142,200	166,374	1.68	321	160,100	187,317	1.68	746
Area 7.....	450	98	274	11,700	32,497	.33	63	12,975	35,989	.32	142
Alpine.....		119	60	270	162			298	179		
Inyo.....	527	92	309	10,155	31,379	.32	61	11,240	34,732	.31	138
Mono.....		149	75	1,275	956	.01	2	1,437	1,078	.01	4
Area 8.....	64	97	81	409,850	302,143	3.05	583	461,175	340,062	3.06	1,359
Calaveras.....	81	83	82	9,700	7,306	.07	13	10,850	8,173	.07	31
Mariposa.....	89	103	96	4,400	3,880	.04	8	4,950	4,365	.04	18
Merced.....	152	99	125	57,400	65,901	.67	128	64,700	74,291	.67	297
San Joaquin.....	39	101	70	203,550	130,870	1.32	252	229,275	147,427	1.33	591
Stanislaus.....	67	90	78	123,500	88,478	.89	170	138,750	99,414	.89	395
Tuolumne.....	17	93	55	11,300	5,708	.06	12	12,650	6,392	.06	27
Area 9. San Francisco Metropolitan.....	46	105	76	2,654,150	1,986,291	20.03	3,826	2,891,500	2,165,727	19.46	8,640
Alameda.....	37	101	69	767,500	529,575	5.34	1,020	837,000	577,530	5.19	2,304
Contra Costa.....	33	68	51	265,000	135,150	1.36	260	290,000	147,900	1.33	591
Marin.....	20	69	45	80,500	36,225	.37	71	87,000	39,150	.35	155
Napa.....	22	74	48	45,250	21,720	.22	42	49,875	23,940	.21	93
San Francisco.....	27	135	81	838,250	678,983	6.85	1,308	898,375	727,684	6.54	2,904
San Mateo.....	126	77	102	198,150	202,113	2.04	390	226,575	231,107	2.08	924
Santa Clara.....	92	98	95	242,000	229,900	2.32	443	264,500	251,275	2.26	1,003
Solano.....	61	80	71	127,500	90,525	.91	174	140,000	99,400	.89	395
Sonoma.....	40	97	69	90,000	62,100	.62	118	98,175	67,741	.61	271
Area 10.....	120	97	108	400,200	433,785	4.37	835	447,750	485,911	4.37	1,940
Amador.....	23	90	57	8,150	4,605	.05	10	9,025	5,097	.05	22
El Dorado.....	39	103	71	14,950	10,521	.11	21	16,650	11,715	.11	49
Nevada.....	59	68	64	19,250	12,211	.12	23	21,500	13,636	.13	57
Placer.....	121	86	104	33,500	34,532	.35	67	37,375	38,518	.35	156
Sacramento.....	115	101	108	231,000	247,272	2.52	481	256,750	274,780	2.49	1,106
Sierra.....		95	48	2,550	1,213	.01	2	2,800	1,332	.01	4
Sutter.....	146	104	125	27,000	33,451	.34	65	31,250	38,709	.35	155
Yolo.....	200	96	148	37,800	55,449	.51	97	43,150	63,284	.52	231
Yuba.....	170	97	134	26,000	34,531	.36	69	29,250	38,840	.36	160

TABLE 73—Continued
CALIFORNIA AIRCRAFT OWNERSHIP PROJECTION—BY AREAS AND COUNTIES—1950 AND 1955

Area County	Indices			1950 Projection				1955 Projection			
	Present Ownership Column 4 Table 61	Economic Column 7 Table 45	Aircraft Potential Owner- Ship	Population Estimate Table 63	Statistical Buying Units	Percent of State Buying Units	Potential Aircraft For Planning	Population Estimate, Table 63	Statistical Buying Units	Percent of State Buying Units	Potential Aircraft For Planning
	Column 1	2	3	4	5	6	7	8	9	10	11
Area 11.....	38	85	62	100,400	62,228	.63	120	106,550	66,004	.59	262
Del Norte.....		98	49	4,150	2,034	.02	4	4,350	2,132	.02	9
Humboldt.....	41	90	66	52,600	34,716	.35	67	55,650	36,729	.33	147
Lake.....	53	85	69	10,500	7,245	.07	13	11,000	7,590	.07	31
Mendocino.....	34	75	55	33,150	18,233	.19	36	35,550	19,553	.17	75
Area 12.....	201	98	150	102,050	151,692	1.53	292	115,900	171,406	1.54	684
Butte.....	123	83	103	58,000	59,740	.60	115	66,250	68,238	.61	271
Colusa.....	421	145	283	10,550	29,857	.30	57	11,400	32,262	.29	129
Glenn.....	237	115	176	17,000	29,920	.30	57	19,375	34,100	.31	137
Tehama.....	288	101	195	16,500	32,175	.33	63	18,875	36,806	.33	147
Area 13.....	253	82	168	40,800	67,838	.68	130	45,150	75,175	.68	302
Lassen.....	121	81	101	19,350	19,544	.20	38	21,300	21,513	.19	84
Modoc.....	278	92	185	10,550	19,518	.19	36	11,775	21,784	.20	89
Plumas.....	449	79	264	10,900	28,776	.29	56	12,075	31,878	.29	129
Area 14.....	82	80	81	60,600	49,307	.50	95	68,800	56,142	.50	222
Shasta.....	97	84	91	27,750	25,253	.25	48	32,525	29,598	.26	116
Siskiyou.....	65	79	72	29,500	21,240	.22	42	32,725	23,562	.21	93
Trinity.....	94	3	84	3,350	2,814	.03	5	3,550	2,982	.03	13

Addendum

In the various Area Treatments given in the Appendices there has been an additional application of data derived from Table 73. To distribute equitably the airplane potentials within the Counties, a buying potential was established for each judicial township by multiplying the average rental for each township by the total dwellings. The applicable township data was taken from the 1940 Census. The total county airplane potentials as given in Table 73 were then distributed to each township according to the proportion that the township buying units bore to the total township buying units for the County.

A graphic representation of the different uses made of aircraft in non-scheduled flying during 1939 is shown in Figure 8. In that year private airplanes were employed as follows: 19.3 percent of the total mileage for commercial purposes, 37.3 percent for instruction, 29.1 percent for pleasure, and 14.3 percent for business. Interest in all these fields has continued unabated. Since the war there has been a large expansion of contract and charter carriers engaged in the commercial flying of passengers and freight. Business utilization today would include not only the transportation of business personnel, but the increasing employment of aircraft by certain industries—agriculture for seeding, dusting and herding; petroleum for geological surveying and pipe-line inspection; fishing for locating fishing grounds. The possibilities of private flying for pleasure and recreation are being more generally recognized.

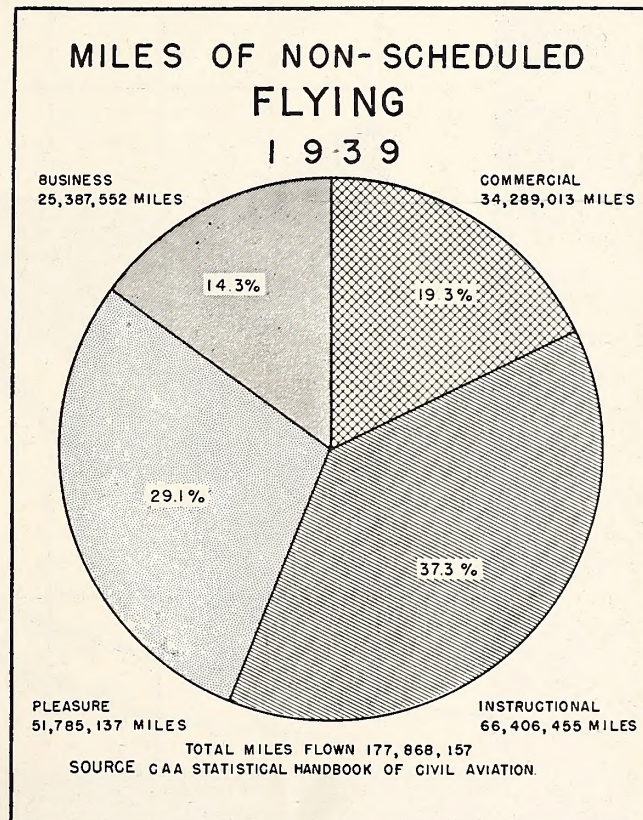


FIGURE 8

TABLE 74—MILES FLOWN IN NONSCHEDULED FLYING BY TYPES—1931-1942 (In thousands)

Calendar Year	Total Flown	Instructional		Commercial		Business		Pleasure	
		Miles	Percent Total	Miles	Percent Total	Miles	Percent Total	Miles	Percent Total
1931-----	94,343	25,323	26.8	26,489	28.1	13,391	14.2	29,140	30.9
1932-----	78,179	17,830	22.8	21,661	27.7	12,343	15.8	26,345	33.7
1933-----	71,223	15,856	22.3	20,195	28.4	12,420	17.4	22,752	31.9
1934-----	75,602	17,360	23.0	20,980	27.7	11,697	15.5	25,565	33.8
1935-----	84,756	23,405	27.6	23,150	27.3	12,655	14.9	25,546	30.2
1936-----	93,320	30,375	32.6	24,608	26.4	11,789	12.6	26,548	28.4
1937-----	103,196	34,559	33.5	22,613	21.9	15,602	15.1	30,423	29.5
1938-----	129,359	46,141	35.7	25,410	19.6	18,818	14.6	38,990	30.1
1939-----	177,868	66,406	37.3	34,289	19.3	25,388	14.3	51,785	29.1
1940-----	264,000	126,264	47.8	31,961	12.1	25,910	9.8	79,865	30.3
1941-----	346,303	197,128	56.9	51,082	14.8	27,439	7.9	70,654	20.4
1942-----	293,593	187,596	63.9	47,290	16.1	29,667	10.1	29,040	9.9

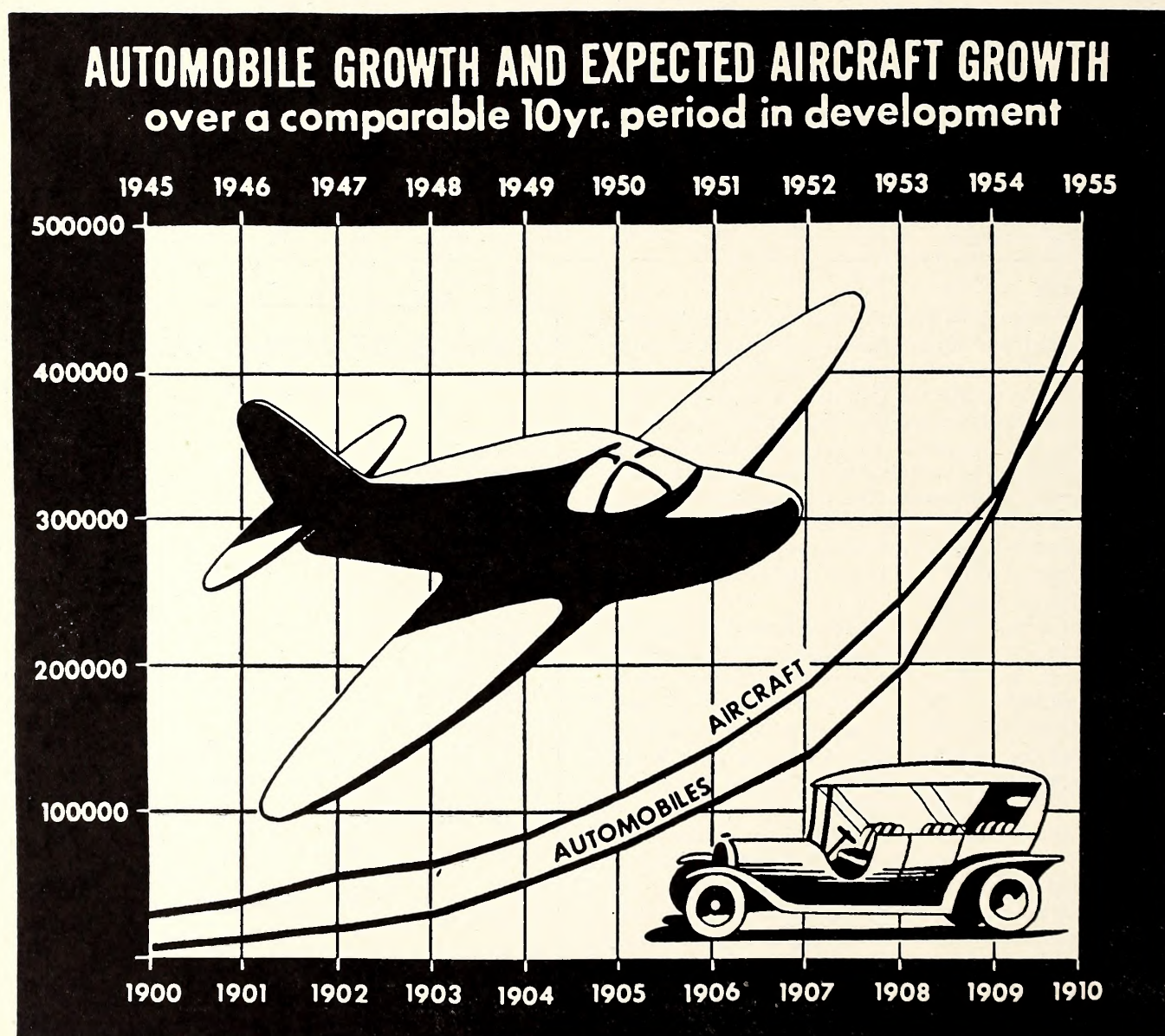


FIGURE 9

All of the various users of private airplanes have to be taught to fly, and notwithstanding the thousands trained during the war, other thousands are now thronging the instruction fields.

Future airport planning must make adequate provision for private aircraft. It is a matter of common knowledge that the public is evincing the same interest in the private ownership and operation of airplanes that it demonstrated for the automobile between 1910

and 1920, and that the demand for airplanes at present is limited only by insufficient ground and service facilities. Millions of our young men became familiar with airplanes during the war and other millions of students in our schools are taking aeronautical courses. The future market for private aircraft should make aircraft manufacturing one of our major industries, the equal in importance to our national economy, of its prototype, the automotive industry.

4. AIR CARGO PROJECTION

Air Freight to Date

Air transportation of cargo, the country's newest and fastest growing industry, started humbly enough in the mid-twenties with the airlines carrying a small amount of express when space was available. Although, as may be seen in Table 64, there was an annual growth in the volume of the traffic, very few predicted a development as phenomenal as that of the railroad or truck carrier industries. The common opinion was that only emergency or luxury shipments would be made by air. The advantages of air mail, on the other hand, early became apparent, and the constantly growing revenue from this source was one of the dependable factors contributing to the development of air carrier service. Inasmuch as nearly a third of air express shipments move part of the way by rail, it was not surprising that the Railway Express Agency handled almost all the cargo transported by air.

The war had a profound influence on the development of air freight traffic. Civilian employment of the facility was impeded, but the Army and Navy demonstrated the feasibility of shipping huge cargoes by air. Before the end of hostilities the Army Air Transport Command was averaging over 12 million plane-miles monthly in air transport. Spurred on by war necessity, great advances were made in airplane and aircraft equipment construction and handling, and the results of these advances in technique are now available to the industry.

One of the most outstanding developments in air freight since the war has been the emergence of thousands of non-scheduled operators throughout the country. By the end of January 1947 a total of 3,585 had applied for operating certificates with the Civil Aeronautics Board. Taking advantage of military aircraft available for conversion to transports and the thousands of trained pilots and personnel, some companies of this type were started at the end of 1945 and many more during 1946. Only a few of these operators confined their activities to passengers; many offered charter and contract services for both passengers and freight, and some were available for freight alone. Most of these companies do a small business, operating on a minimum of capital. One of them, on the other hand, has become the largest air freight carrier in the United States, and

between March 1946 and February 1947 hauled 12,500,000 ton miles of goods. Pending a final decision on their certification as common carriers, the non-scheduled operators have hauled an impressive total of freight, and provided the impetus towards a downward trend in rates.

Despite the relatively small revenue from air freight at the start, the established domestic airlines have taken steps to retain their share of the market. Air freight, together with express, was only five percent of the airline operating revenue in 1945, but soon became more important. In the autumn of 1946, Mr. P. W. Pate of Delta Air Lines predicted, "Air freight will be the major source of revenue and profit for domestic airlines within ten years."¹ Trans-World Airline started experimental air freight on July 1, 1945 restricted to five large cities. In 1946 American Airlines began a separate contract air freight service, distinct from their express service. In 1946 a total of thirty-seven million ton miles of air freight and express was transported in the United States by certificated air carriers alone. United Air Lines flew more than one and one-quarter million ton miles of air freight and express in April, 1947, representing an 87 percent increase over the same period in 1946, according to estimated figures recently released. Freight alone was up 159 percent over 1946 and air express showed a 43 percent gain to bring United's total cargo ton miles for April, 1947 to an estimated 1,263,000. The company's Mainliners and Cargoliners have flown 4,702,000 cargo ton miles in the first four months of 1947. Air freight is no longer a theoretical possibility but a rapidly growing industry. It is already possible to draw preliminary conclusions about likely air freight candidates, trends in rates, and the types of business organization developing.

The greatest advantage that air transport can offer over surface carriers—speed—will probably determine for some time the nature of air freight candidates. Goods perishable by their nature—such as vegetables, fruit, flowers, seafoods and certain pharmaceuticals—and goods with perishable markets—such as fashionable apparel, motion picture film and periodicals—have all been shipped by air. Emergencies of various kinds can make almost any commodity an air transport candi-

¹ American Aviation, Sept. 1, 1946.

date. Machine or airplane parts may suddenly be needed across the country; disasters create an emergency call for food, drugs and supplies. Ordinary business is making use of the new speed in transport for quick shifting of inventories from one locality to another. In addition to those requiring speed in marketing, goods shipped by air have tended to be relatively valuable in proportion to their bulk. An examination of air express shipments handled by the Railway Express Agency (see Table 75) will show the variety of goods transported by air although it must be kept in mind that air freight with cheaper rates will change the nature and relative amounts of commodities shipped.

TABLE 75
AIR-EXPRESS ANALYSIS, APRIL, 1941
RAILWAY EXPRESS AGENCY SHIPMENTS

Commodity Group	Percent of total	
	Shipments	Weight
Machinery, Hardware.....	23.26	31.67
Printed Matter.....	15.11	28.06
Store Merchandise.....	13.39	9.25
Motion Picture Films.....	4.32	5.62
Electros, Matrices.....	6.11	3.51
Cut Flowers.....	3.63	2.48
Valuables.....	8.25	4.24
Miscellaneous.....	2.44	2.01
News Photos.....	4.42	.79
Drugs.....	1.46	1.08
Transcription Records, Radio Parts.....	4.53	2.04
Freight Manifests.....	4.36	1.61
Jewelry.....	2.60	.75
Food and Raw Samples.....	1.78	1.02
Optical Goods, Cameras.....	1.85	1.14
Personal Baggage.....	2.19	4.52
Liquor.....	.30	.21
	100.00	100.00

Source: "Air Transport of Agricultural Perishables," United States Department of Agriculture, Miscellaneous Publication No. 585.

The very development of the air freight industry has depended upon rates low enough to attract customers; low rates could only be profitable with a large volume of business. The fact that the domestic airline companies met the challenge, have been willing at times to operate at a loss during the developmental period, and have succeeded in creating a flourishing new industry is another triumph of the American competitive system. It might be mentioned in passing that this has all been accomplished without direct government aid or subsidies of any kind.

The lowering of air freight rates has been spectacular and far more rapid than that envisioned as possible by close students of the problem. In 1942 the average ton mile rate for railway express was about nine cents. Air express at that time cost 80 cents a ton mile, and

even when this was reduced to 70 cents on July 15, 1943, possibilities of a large volume development of the air transport industry appeared remote. The first air freight tariff was filed by American Airways, Inc. and went into effect October 15, 1944. This provided four class rates with a special price on perishables. For less than plane-load lots it cost \$51.70 to ship 100 pounds of commodity Class A from Detroit to Los Angeles, \$44.70 for Class B, \$37.70 for Class C, and \$30.70 for Class D. A minimum load of 5,000 pounds of perishables cost \$24.80 per hundred pounds between the same two points. Trans World Air Line began an experimental air freight on July 1, 1945 restricted to five cities. A four classification rate ranging from 30 to 50 cents a ton mile with a separate charge for pickup and delivery was offered.

United Air Lines broke with traditional rail and truck patterns in February 1946 and set up a single class tariff graduated, according to volume and distance, to give the lowest possible rates for long haul, volume shippers. The company charged \$8.78 to carry 25 pounds from New York to the Pacific Coast, and \$33.63 for 100 pounds. A special rate of 15 cents a ton mile was offered for plane loads of fruits and vegetables. These charges did not include pickup or delivery and the goods, in contradistinction to express, were carried only when space was available. American Airlines in April 1946 adopted a similar single class tariff. The other major domestic airlines soon followed this lead which brought the average base rate for freight down to 26.5 cents a ton mile.

The next development came in June 1946 when twelve scheduled airlines filed joint agreements for a consolidated tariff with each line maintaining its own regulations and rates. The actual rates were very similar and patterned after the single class commodity plan already in effect. United Air Lines went still further and filed a new tariff with C.A.B. to go into effect August 17, 1946. This provided no changes up to 3,000 pounds, but proposed a rate of 17½ cents per pound or 14 cents per ton mile for a cross country haul of 16,000 pounds or more. On a shipment of 7,500 pounds the rate between New York and the Pacific Coast amounted to \$23.54 per hundredweight or 18.8 cents per ton mile. This tariff was approved and is still in effect.

The non-scheduled operators, mentioned above, early took advantage of the lack of certain government restrictions, designed primarily for the protection of passengers and required of the common carrier lines, to lower their freight rates. A charge of 20 cents per ton mile was not uncommon, and a few went as low as 12½ cents. The scheduled lines, sensitive to this diversion of part of the market, replied by filing for certification for separate air freight contract service. American Airlines began such a service in 1946 with a volume shipment rate of 11 cents per ton mile, and other lines soon followed the pattern set. The rates cited are actu-

ally in effect and delimit precisely the progress of the air transport industry to date, the nature and volume of commodities likely to be airshipped, and the degree of competition with surface transport.

The development of the American air freight industry up to the present has indicated certain tendencies in organization which may become important. Both the scheduled and non-scheduled operators have shown an inclination to unite for common purposes. The consolidated tariff filed by the majority of certificated airlines in 1946 has been mentioned. Many of the same lines have joined to form Air Cargo, Inc., a permanent cargo ground service organization to provide for pickup and delivery service at terminal points and to employ joint facilities and personnel for cargo operation at airport terminals. The eastern non-scheduled air companies early formed the Institute of Air Transportation to further their common purposes, and the west coast contract carriers have a similar organization, the Non Scheduled Air Cargo Associates.

Summary of Projections

Many serious studies of projections of air freight potentials were made during and since the war. Since sufficient data was not, and still is not, available to establish a scientific, statistical trend line, the projections had to be estimated on other bases than previous development. Economic projections, at best, are somewhat foolhardy; certain assumptions of the projections of air freight development have already proved erroneous, notably the rapidity with which air freight rates would be lowered.

The Business Research Department of the Curtis-Wright Corporation issued one of the first predictions in March 1944.¹ This study assumed that air freight would not be able to compete with surface transport on a rate basis, but would be diverted mainly from railway express and parcel post. The portion of the latter in 1940 which would benefit from air carriage was taken as 325 million ton miles. A projected demand curve of this figure was made at various possible rates giving weight to probable developments such as increased national product, doubling of air routes, and new traffic. The monograph ended with a predicted potential of 37.7 million ton miles of traffic in 1946 at a 40 cent rate, and 110.1 million ton miles in 1950 at a 30 cent rate. This study has been criticized for being based entirely on manufactured goods and for shifting the demand curve too far to the left by using 1940 prices. Obviously, the assumed air freight rates were too high.

Slick Airways, Inc., in their scholarly brief presented to the Civil Aeronautics Board to support their application for certification², argued that the Curtis-

Wright estimated potential was far too low and predicted 1.2 billion ton miles of traffic in 1947 and 5 billion ton miles in 1950. Except for some entirely unforeseen development, this projection appears much too optimistic.

Dr. Edward P. Warner concluded that 60 million ton miles of freight would move by air at 20 cent rate, 300 million ton miles at 10 cents, and 2 billion ton miles at 6 cents.

Air Cargo, Inc., made surveys of 13 types of cargo candidates and decided that, at rates 25 percent higher than railway express, half of the 1939 rail express, or 145 million ton miles, would be shipped by air.

W. F. Fuller pointed out that during the war rail freight amounted to 700 billion ton miles a year, truck freight 46 billion ton miles, and railway express in 1945 rose to 2½ billion ton miles. Thus, the total freight in the United States was probably a trillion ton miles and it would take 500 airplanes of DC-4 type to handle 2 percent of this amount, most of which moved at a cost of less than one cent per ton mile. If air rates could be cut to 15 cents, the potential volume would be increased two and a half times and really big business would develop only with a 10 cent rate.³

There have been several carefully worked out air freight potentials for special commodities. One of the best of these, by Spencer A. Larsen⁴, limited to fresh fruits and vegetables, concluded that only a negligible proportion of the traffic volume of these commodities would be diverted to air at rates of 15 or 10 cents per ton mile and that only 2 percent of the gross traffic would be diverted at a rate of 7 cents. At 5 cents, however, 6 percent of the traffic would go by air, and finally, at 3 cents per ton mile, 25 percent, or more than 4 billion ton miles, would be shipped air freight.

Another similar study on drugs and pharmaceuticals by S. A. Larsen and W. Reitz⁵, based on 1939 production data, predicts that 5.04 percent of the drug traffic, or 12,316,000 ton miles, would be available to air transportation at 10 cents per ton mile if there were no saving over existing rates, and 19.67 percent, or 48,066,000 ton miles, would so move at 5 cents. Projections of this kind, if available for all probable air candidates, would make an impressive total.

These estimates of air freight potential, based on different assumptions, differ widely in the total volume reached. Such a result might be expected if we consider the paucity of developmental data and the unprecedented rapidity of growth of the industry. The predictions all agree, however, on the future importance of the industry. It is obvious that the air freight potentials of 100 million ton miles for 1950 and 600 million for 1955, given in Table 64, are essentially conservative.

¹ McDonald, B. A. and Drew, J. L., "Air Transportation in the Immediate Postwar Period," Curtis-Wright Corp., Business Research Dept., 1944.

² Civil Aeronautics Board, Docket No. 2243, "Before the Civil Aeronautics Board Exhibits of Slick Airways, Inc., Docket No. 810 et al. Air Freight Case."

³ Fuller, W. F., "Freight by Air—How much? How soon?" *Air Transport*, Oct., 1946.

⁴ Larsen, S. A., "Air Cargo Potential in Fresh Fruits and Vegetables," Wayne University Press, 1944.

⁵ Larsen, S. A. and Reitz, W., "Air Cargo Potential in Drugs and Pharmaceuticals," Wayne University Press, 1946.

California as Air Freight Market

Because of the particular nature of its exports and imports California would benefit more than any state in the country from a rapid extension of air freight. Continued improvement of transportation, particularly much speedier transportation, is essential to California's economy, which is not self-sufficient. California is primarily an exporter of highly perishable agricultural produce and high value, low bulk industrial specialties, while its rapidly expanding population makes it one of the richest and fastest growing markets for the entire country's industry. Only air freight can adequately meet the requirements of this basic exchange of produce and provide for its assured expansion.

California's climate and fertility make it the Nation's most important producer of fresh fruits and vegetables. From 1909 to 1936 its farm production increased over 120 percent; since then it has ranked at or close to the top in annual value of farm production, and there is no indication that this production has reached its peak. It has been predicted that agricultural production and markets for this production will increase one quarter in the next fifteen years¹. In a normal year California produces nearly one-half of the Nation's fresh fruit, one-third of its truck crop, and almost one-third of its canned fruit and vegetables. In 1938 California was first of the states in the production of grapes, prunes, plums, peaches, apricots, pears, cherries, olives, figs and almonds. It is also virtually the sole raiser in the United States of apricots, quinces, lemons, dates, nectarines, persimmons, olives, avocados, guavas and papayas.

Of California's vast fruit and vegetable production a large amount is surplus and shipped out of the State. Much of the specialty crops and about 10 percent of other agricultural commodities are available for export. Out-shipments account for 63 percent of the value of fruits and nuts raised and 24 percent of the value of vegetables. On a tonnage basis about 30 percent of the fruits and nuts are exported. These exports are not concentrated in one short harvesting period. Because of its climate California enjoys a long growing season and some agricultural produce is exported every month in the year. The principal markets for these highly perishable commodities are in the east and midwest, some 2,000 miles distant. Normal delivery time of rail carlot shipments to Chicago is seven days, to New York from eleven to twelve days. L.C.L. shipments take longer, express considerably less time. The value of any transportation medium, however, which can speed up delivery 75 percent or more seems immeasurably important for California's future.

Manufacturing in California developed slowly but steadily up to World War I. Since that time California has become one of the principal manufacturing states

in the Nation and by 1939 the value of its manufactured products reached 2½ billion dollars. An examination of Table 76, showing the number of establishments engaged in manufacturing certain selected high value commodities in 1939, will give some indication of the wide variety of California's industrial products. The phenomenal growth of California industries during the last war is common knowledge.

Air freight can play an important role both in servicing these industries and in distributing their products. Among the most important of these products are canned vegetables, fruit, sea-food and meat; aircraft and parts; automobiles and parts; metal and machine products; rubber tires and inner-tubes; and motion pictures. Canned, frozen, or dried food is not likely to move by air. The aircraft industry, however, the bulk of which is located in California, can receive great benefit from rapid air transporation in servicing the

TABLE 76
NUMBER OF ESTABLISHMENTS IN CALIFORNIA
MANUFACTURING SELECTED HIGH VALUE
COMMODITIES—1939

	Number	Percent U. S. Total
Men's Furnishing Goods.....	35	4.2
Men's, Youth's, and Boys Clothing.....	102	3.4
Miscellaneous Apparel and Allied Products.....	11	3.9
Silk Manufacturers.....	1	-----
Women's, Misses' and Children Apparel.....	434	5.1
Lithographing.....	17	4.4
Photo Engraving, not in Printing Establish- ments.....	55	8.3
Printing and Publishing, Book Music and Job.....	812	7.4
Perfumes, Cosmetics and other Toilet Prep- arations.....	32	5.7
Rubber Goods Other than Tires, Inner Tubes, Boots and Shoes.....	35	8.5
Cutlery (not Silver and Plated) and Edge Tools.....	7	2.6
Tools, not Edge Tools, Machine Tools, Files and Saws.....	12	5.8
Clocks, Watches, Parts except Watchcases.....	2	2.6
Jewelry.....	61	6.1
Cash Registers, Adding Machines, other Business Machines except Typewriters.....	5	5.4
Electrical Machinery, Apparatus and sup- plies.....	106	7.6
Machine Tools.....	2	.8
Radio Apparatus and Phonographs.....	31	15.8
Typewriters and Parts.....	1	5.0
Aircraft and Parts.....	12	15.2
Dentist Equipment.....	5	5.8
Fur Goods.....	58	2.4
Instruments and Apparatus, Professional, Scientific, Commercial and Industrial.....	21	7.4
Musical Instruments and Parts.....	6	6.4
Optical Goods.....	6	6.0
Pens and Pen points.....	1	1.9
Photography Apparatus and Motion Picture and Projection Apparatus.....	15	12.7
Surgical and Orthopedic Appliances.....	14	4.6
Drugs and Medicines.....	52	4.9

Source: Industrial Market Data Handbook of the United States, 1939.

¹ Clawson, C. and Calhoun, W., "Long Term Outlook for Western Agriculture," June, 1946.

industry's branches and in supplying spare parts where needed. Automobile branch factories, which are being established in growing numbers in the State, can use air freight service in the same way. The motion picture industry is already making wide use of air transportation for its films and in time such delivery on a world-wide basis may be commonplace. Although there is a net importation of manufactured goods over exportation, California's industrial specialties which are exported all belong to vigorously expanding industries likely to make full use of air freight facilities.

California is a rich and growing market for its own and the entire country's industry. The effective buying income per family in 1945 was estimated by *Sales Management* as \$4,818 or 116 percent of the national average, and all indices of wealth in California are high when compared to the country's level. The basic principle of California's economy is a large net movement of potential agricultural air candidates out and a big net movement of potential industrial air candidates into the area. This fact is brought out clearly in Table 77.

The bulk of the finished consumer goods imported into California originate in the east and midwest which

also are the principal consumers of California's exports. This fact should greatly facilitate the development of air freight as specially built cargo airplanes will be assured of a pay load coming and going. California's imports originate within relatively concentrated areas with a dense population; its exports can be air shipped to these same centers for local distribution by airplane or truck. Within a very short time the exports by air freight will probably be large enough for full plane loads to each city concerned.

Conversely, most of California's imports are shipped to a few metropolitan centers which serve as hubs for trading areas collectively covering the State. Thus, the principal agricultural regions of California are within a one hundred mile radius of a metropolitan trading district. Such a distributional geography is especially favorable for air freight, particularly at the start when less than full loads would tend to impede lowering of rates.

Both the complementary nature of its imports and exports and the unusually well integrated import and export areas make California an immediately important and ultimately superior air freight market.

TABLE 77
TONNAGE OF REVENUE FREIGHT IN SELECTED
COMMODITIES—CALIFORNIA—1944

Commodity	Originating (Thousands of Tons)	Percent of U. S. Total	Terminating (Thousands of Tons)	Percent of U. S. Total
Oranges and Grapefruit.....	1,478	37.6	106	2.6
Berries.....				
Cantaloupes.....	180	67.6	8	2.8
Fresh Grapes.....	332	94.3	26	6.0
Peaches.....	72	23.4	21	6.0
Fresh Domestic Fruits.....	197	34.6	59	9.7
Onions.....	73	12.5	62	10.5
Tomatoes.....	68	18.3	17	3.8
Fresh Vegetables.....	1,049	41.0	77	2.8
	3,449		376	
Agricultural Implements and Parts S.O.S.....	6	.5	28	6.0
Automobile and Auto Trucks, K.D. and Parts S.O.S.....	108	.4	288	1.8
Automobile and Auto Truck Tires.....	67	.8	56	5.1
Furniture, Metal.....	15	1.9	34	5.3
Furniture, Other.....	50	4.4	141	7.1
Canned Food Products N.O.S.....	2,510	3.3	1,781	4.3
Manufactures and Miscellaneous.....	5,823	4.0	10,552	4.0
	8,579		12,880	
Total All Agricultural Products.....	8,832	6.2	6,215	5.6
Total All Manufactured and Miscellaneous.....	20,224	7.9	30,305	4.0
Total Forwarder Traffic.....	28	.1	421	9.7

Note: Data for Class 1 railroads only.

Source: Interstate Commerce Commission, Bureau of Transport Economics and Statistics, *Statement No. M-550 (SCS)*

Examination of Certain Imports and Exports

The potential importance of California's agricultural perishables as air freight candidates has already been discussed in general. A more detailed examination of the question with such data as is available only proves more conclusively the great magnitude of the air cargo market waiting for development.

TABLE 78

CARLOTS OF SELECTED FRESH FRUITS AND VEGETABLES ORIGINATING IN CALIFORNIA—1939

Commodity	Number of Carlots Originated in California	Percent of United States Total
Asparagus.....	1,607	80.0
Cabbage.....	1,049	5.6
Cantaloupes.....	7,479	56.7
Carrots.....	10,361	76.0
Cauliflower.....	5,143	67.0
Celery.....	9,282	46.0
Tomatoes.....	3,653	12.8
Grapes.....	31,422	98.8
Honeydews.....	2,610	58.3
Lettuce.....	37,943	72.5
Melons.....	1,996	95.4
Peaches.....	6,778	33.8
Pears.....	6,659	41.0
Green Peas.....	4,448	57.0
Plums.....	3,468	55.5

¹ Trends in Railroad Traffic, Freight Rates and Prices, Perishable Agricultural Commodities, United States, May, 1941. United States Department of Agriculture, May, 1941.

It must first of all be stressed that speedier transportation of California's agricultural specialties will benefit not only California but the entire country. A listing of carlots of selected fresh fruits and vegetables originating in California in 1939 compared with the United States total (see Table 78) shows the dependence of the country on California's farms and orchards.

In 1941 California originated 32 percent of all the carlots of fruits and vegetables moving distances over 250 air miles in the United States.²

A second preliminary consideration to be kept in mind is that, although there is naturally some seasonal concentration, California has an unusually long growing season and the vast range of its produce provides one crop or another maturing throughout the year. Many crops, raised in California when the rest of the country is snow-bound, immediately enter the high-priced specialty class and become eminently suited for air transportation. Table 79 tabulating the 1930-1939 average rail shipments for the fresh vegetable and fruit market brings this fact out clearly:

² p. 6 Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*.

TABLE 79

1930-1939 AVERAGE RAIL SHIPMENTS FRESH VEGETABLES AND FRUIT

Commodity	Shipments Originating in California	Shipments Originating in the United States	California ³ as Percent of United States
Cherries.....	1,070	2,349	46
April through June.....	1,041	1,722	60
Pears.....	7,107	18,655	38
June through August.....	5,243	7,554	69
Plums and Prunes.....	3,725	6,463	58
May through July.....	3,139	3,189	98
Asparagus.....	3,268	5,665	58
March through April.....	2,546	3,206	79
Cauliflower.....	8,388	14,170	59
December through May.....	6,831	7,261	94
Celery.....	12,826	29,523	43
November through June.....	11,060	21,905	51
Lettuce.....	41,256	59,738	69
10 months except December and March.....	36,845	49,702	74
Peas.....	6,187	10,742	58
September through May.....	5,242	6,966	75
Tomatoes.....	9,024	40,717	22
October through November.....	3,506	5,109	69
Cantaloupes.....	19,299	31,658	61
April through June.....	10,505	12,187	86

³ Clawson, C., and Calhoun, W., *Long-term Outlook for Western Agriculture*.

A well organized pickup service should provide the air freight companies adequate plane loads throughout the year.

One of the most thorough studies of potential air freight to date dealt with the transportation of lettuce from Salinas to Detroit.⁴ The conclusions of this study were based not only on information available but on test shipments and test sales at set prices, and are still applicable to the air marketing of this commodity. In 1943 over 10,000 carloads of lettuce from California and Arizona were unloaded in Chicago, Detroit, Pittsburgh, Cleveland, Buffalo, and Milwaukee. Of this total 52.1 percent came from Salinas-Watsonville from April to November and 42.6 percent from the Imperial Valley and Arizona from December to March. Shipments of lettuce from these districts differ less throughout the year than any other main fruit or vegetable. The study concluded that if airplanes flew the shortest distance between refueling points, if the lettuce were cleaned in the field and dry packed in lighter containers, and if spoilage were eliminated, lettuce could be transported by air at a cost of 3.75 cents a pound more than surface rates and still find a ready sale because of its better quality. A total of 1,001 C-54A planeloads of lettuce could be sold at Detroit annually and 5,561 planeloads at the other major cities mentioned.

⁴ Hoecker, R. W., and Waldo, R. K., *Post-War Air Transport Costs and Markets for Lettuce*.

Spencer A. Larsen's monograph on the air transport of fresh fruits and vegetables¹ furnishes a carefully considered basis for projected estimates of the volume of air freight transportation of these commodities in 1950 and 1955. Starting with the total of carlot shipments in 1941 of various fruits and vegetables which moved more than 250 miles to the ten main metropolitan cities in the United States, Mr. Larsen took a sampling of the opinions of numerous wholesale and retail dealers as to what percentage of these commodities would sell at various transportation rates. The results of his estimated potential air traffic follow in Tables 80 and 81.

The first step in working out potentials from these percentages will be found in the separate area treatments. The tonnage of fresh fruits and vegetables shipped out of each county was calculated from carlot shipments made in 1945.² Next, the tonnage of each commodity that might move by air was computed by using the percentages worked out by Mr. Larsen and assuming that a 7 cent rate was possible in 1950 and a 5 cent rate in 1955. The conclusions of the projection are given in Table 82. The tonnage likely to be shipped by air in 1950 and 1955 were converted into DC-3 and DC-4 airplane loads. These airplane loads were then divided by one-half—an arbitrary but apparently fair figure—of the average days in a normal growing season in each county in order to reach the possible schedules per day. All assumptions used in the process, such as the rates likely to prevail in 1950 and 1955, were conservative, but the results are impressive. In 1950 there will be 70,701 tons of perishable fruits and vege-

TABLE 80

ESTIMATED POTENTIAL AIR TRAFFIC IN FRESH FRUITS
TO METROPOLITAN AREAS IN THE UNITED STATES
AT TON-MILE RATES INDICATED

Commodity	Estimated Air Traffic Potential at Ton-Mile Rates of		
	7 Cents, Percent	5 Cents, Percent	3 Cents, Percent
Apples.....	0	0	0
Apricots.....	2	8	38
Avocados.....	3	18	55
Cantaloupes.....	2	8	46
Cherries.....	9	30	75
Figs, fresh.....	9	21	51
Grapefruit.....	0	0	5
Grapes.....	1	5	20
Honeydews.....	0	2	20
Lemons.....	0	0	2
Oranges.....	0	0	1
Peaches.....	7	23	78
Pears.....	0	2	7
Plums, Prunes.....	1	13	53
Raspberries.....	65	95	100
Strawberries.....	65	95	100
Tangerines.....	0	3	9
Watermelons.....	0	0	0

TABLE 81

ESTIMATED POTENTIAL AIR TRAFFIC IN FRESH VEGETABLES
TO METROPOLITAN AREAS IN THE UNITED STATES
AT TON-MILE RATES INDICATED

Commodity	Estimated Air Traffic Potential at Ton-Mile Rates of		
	7 Cents, Percent	5 Cents, Percent	3 Cents, Percent
Asparagus.....	15	28	62
Beans (snap).....	10	50	86
Beets.....	3	20	60
Broccoli.....	0	5	40
Brussels Sprouts.....	2	10	40
Cabbage.....	2	7	28
Carrots.....	0	0	6
Cauliflower.....	0	6	35
Celery.....	0	7	33
Corn.....	14	39	83
Cucumbers.....	2	13	50
Endive.....	7	28	87
Lettuce.....	6	18	47
Mixed Vegetables.....	0	6	39
Onions.....	0	0	4
Peas.....	3	17	75
Peppers.....	5	14	53
Potatoes.....	0	0	0
Radishes.....	3	12	55
Shallots.....	2	11	35
Spinach.....	4	15	63
Sweet Potatoes.....	0	0	3
Tomatoes.....	23	43	81
Turnips (with tops).....	0	14	42

tables waiting to be loaded into air cargo ships, a tonnage that would require 204 schedules per day for airplanes of the DC-3 type or 45 schedules per day for cargo planes of DC-4 load capacity. In 1955, with a further lowering of rates, 228,435 tons of fruits and vegetables will be available for air transport, an amount requiring 652 schedules per day for DC-3 type or 147 schedules for DC-4 type airplanes.

Although the air shipment of California's fruits and vegetables has barely begun, sufficient amounts have already been shipped and enough research and experimenting in packaging and refrigeration done to make the industry a practical, going business. The Ralph E. Myers Co., of Salinas, must be given a large share of credit for pioneering the industry and proving its feasibility. In 1945 the Pacific Fruit Exchange shipped 50,040 pounds of cherries and 20,000 pounds of plums to New York by air and 10,008 pounds of cherries to Pittsburg. In July 1946 one of the non-scheduled carriers contracted to fly 5-ton loads of strawberries and raspberries to the East six times weekly, and certain California berry growers were reported to be planning enlarged acreages to supply the new markets. A packaging association was incorporated in the southern part of the State in 1946 by

¹ Larsen, S. A., *Air Cargo Potential of Fresh Fruits and Vegetables*, Wayne University Press, 1944.

² California Crop and Livestock Reporting Service and Federal-State Market News Service, *California Carlot Shipments, Fresh Fruits and Vegetables, 1945*.

[illegible]

TABLE 82—Continued
AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES BY CALIFORNIA AVIATION
AREAS AND COUNTIES—1950 AND 1955

Area County	Days in Normal Growing Season	1950					1955				
		Perishables Tons Likely Air Freight Candidates	Potential Loads		Required Daily Flights— Half of Growing Season		Perishables Tons Likely Air Freight Candidates	Potential Loads		Required Daily Flights— Half of Growing Season	
			DC-3 at 5,000 Lbs.	DC-4 at 22,700 Lbs.	DC-3	DC-4		DC-3 at 5,000 Lbs.	DC-4 at 22,700 Lbs.	DC-3	DC-4
Area 9. San Francisco Metropolitan.....		3,926	1,570	346	10.00	2.00	11,883	4,753	1,047	31.00	7.00
Alameda.....	351	1,151	460	102	2.62	.58	3,393	1,357	299	7.73	1.70
Contra Costa.....	290	2,045	818	180	5.64	1.24	5,009	2,004	441	13.82	3.04
Marin.....	252						1				
Napa.....	259	5	2		.02		26	10	2	.08	.02
San Francisco.....	356	1					18	7	2	.04	.01
San Mateo.....	319	12	5	1	.03	.01	42	17	4	.11	.03
Santa Clara.....	299	677	271	60	1.81	.40	3,149	1,260	277	8.43	1.85
Solano.....	239	17	7	1	.06	.01	156	62	14	.52	.12
Sonoma.....	207	18	7	2	.07	.02	89	36	8	.35	.08
Area 10.....		3,432	1,373	302	9.00	2.00	11,516	4,607	1,015	33.00	7.00
Amador.....											
El Dorado.....	181	8	3	1	.03	.01	337	135	30	1.49	.33
Nevada.....											
Placer.....	262	302	121	27	.92	.21	3,114	1,246	274	9.51	2.09
Sacramento.....	307	2,790	1,116	246	7.27	1.59	6,613	2,645	583	17.23	3.80
Sierra.....											
Sutter.....	273	86	35	7	.26	.05	553	221	49	1.62	.36
Yolo.....	250	228	91	20	.73	.16	752	301	66	2.41	.53
Yuba.....	273	18	7	1	.05	.01	147	59	13	.43	.10
Area 11.....		26	10	2	1.00		508	203	44	2.00	1.00
Del Norte.....											
Humboldt.....											
Lake.....											
Mendocino.....	208	26	10	2	.10	.02	508	203	44	1.95	.42
Area 12.....		110	44	10	1.00		399	160	35	1.00	1.00
Butte.....	234	39	16	4	.14	.03	164	66	14	.56	.12
Colusa.....											
Glenn.....											
Tehama.....	274	71	28	6	.20	.04	235	94	21	.69	.15

Source: Days in normal growing season from Economic Survey of California, 1946, Research Department, California State Chamber of Commerce.

cessfully. Among these are newly hatched chickens and turkeys. It has been scientifically demonstrated that chickens can live without food or water from 53 to 72 hours after hatching. Taking advantage of this fact, one-third million baby chickens and turkeys have been shipped by air from Sacramento and 100,000 from Petaluma. Markets for this produce are world-wide and its future development large.

Another California industry destined to benefit from air transport is seafood. In 1942 over a billion pounds of fish, shellfish, and whale products, valued at \$25,543,934 was caught along the California coast.¹ Up to the present practically the entire catch was consumed locally or canned. With air freight available there should be a growing volume of shipments of certain varieties out of the State. It is a proved fact that even fish-producing regions buy varieties not found locally, and the inland markets of the country should welcome freshly landed catches from the Pacific Ocean.

There has already been a brief discussion of the use of air freight by California's manufacturing industries

Notes: Perishables included in likely air candidates—See previous Tables 80 and 81.

Areas 7, 13 and 14 omitted because of low potentials.

—aircraft, automobiles and motion pictures. Other industries have already shown their interest in the speedier forms of transportation. During the last few years California's garment industry has reached a volume of \$400,000,000 annually, and sufficient sportswear and similar garments are shipped daily from Los Angeles alone to fill 14 railway cars. Following the lead of eastern manufacturers, California stylists have now begun to ship by air. One of the leading non-scheduled carriers early in 1947 contracted with some of the largest New York stores, including Macy's and Gimbel's, to carry California garments east. Large individual shipments are not unusual; for example: a certain shipper recently sent 100,000 leather jackets to Detroit by air. Such shipments help to build up adequate pay loads east, especially at the present stage of development at the end of the seasonal harvesting of a particular agricultural perishable.

¹ Division of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior.

During some of the earlier discussions of air freight, doubt was expressed that cargo planes could find adequate load factors on the west bound flight. As the air transport industry has developed to date, the converse has been true. Goods have often piled up at eastern terminals waiting for available planes.

In 1946 a group of specialists made a study of the air freight potential of the women's apparel industry in New York.¹ A survey was made by personal interviews with manufacturers and questionnaires to consignees, who pay the transportation and indicate the method of shipment. The New York area is the foremost producer of this type of goods in the country and fortunately is one of the largest terminals for California exports. The study concluded that, while speed was very important in transporting women's apparel, attention must also be given to clean, adequate packing, and well organized pickup service. The estimated yearly potential volume of women's apparel available to air transportation between the New York Metropolitan Area and the San Francisco Bay Area is impressive as an indication of the possible volume of air imports into California. (See Table 83)

TABLE 83

**AIR FREIGHT POTENTIAL—WOMEN'S APPAREL
INDUSTRY IN NEW YORK**

**Estimated Yearly Potential Volume of Women's Apparel Available
To Air Transport Between the New York Metropolitan Area
and San Francisco Bay Area**

(Based on an assumed air freight rate of
10-14 cents per ton mile)

	Flow via All Transport Media, lbs.	Immediate Air Poten- tial, lbs.	Eventual Air Poten- tial, lbs.
Furs and Fur Garments..	330,000	330,000	330,000
Dresses.....	1,600,000	580,000	960,000
Blouses and Waists.....	188,000	64,000	113,000
Suits.....	399,000	120,000	220,000
Separate Jackets and Skirts.....	406,000	80,000	160,000
Separate Coats.....	535,000	134,000	268,000
Beachwear and Slacks...	156,000	23,000	62,000
Sweaters.....	589,000	118,000	236,000
Bathing Suits.....	55,000	11,000	22,000
Children's Wear.....	263,000	66,000	105,000
Millinery.....	726,000	260,000	426,000
Neckwear, Scarfs, Hand- kerchiefs.....	320,000	85,000	150,000
N negligees and Robes.....	413,000	112,000	190,000
Gloves (Fabrics).....	122,000	31,000	60,000
Handbags and Small Leather Goods.....	306,000	327,000	653,000
Underwear (Woven).....	1,195,000	238,000	478,000
Corsets and Brassieres...	526,000	80,000	145,000
Shoes (High Priced).....	150,000	150,000	150,000
Total.....	9,279,000	2,809,000	4,728,000

This indicated air transport potential of retail store merchandise is already in process of realization. Rail express from New York to the Pacific Coast costs \$12.96 per hundredweight plus an additional charge. In the winter of 1945, when air carriers began to charge less than \$20. a hundredweight, California retail merchants

started to use air transport in order to get speedy delivery of scarce items of merchandise. In the middle of 1946, the major non-scheduled lines began to charge \$14. per hundred weight and the rapid trend towards air transportation started. One of the largest contract flyers has a flat volume agreement with the Western Traffic Association, an organization of department stores and specialty shops, to fly one plane load daily from Newark to San Francisco. Another company has a contract with the same organization and makes at least one flight daily from New York to Los Angeles with a guaranteed 36 hour service. The first contract carrier mentioned, under a second contract, brings retail merchandise from Newark to Los Angeles on an average of six plane-loads a week. The goods carried range from furs to glassware with women's coats, dresses and accessories forming the main volume. Besides the Western Traffic Association, some of the larger individual stores are making contracts with air carriers. It is estimated that 75-80 percent of the merchandise which the California retailers want shipped by express originates in the New York area.

There is definite proof in the California air imports and exports already actualized that the air transport industry in this State faces a future of great expansion and that the principal export destinations and import origins tend to coincide.

Future of Air Freight Traffic

The future of the air freight industry in California does not depend alone on adequate markets and cargo potential; certain technical questions of equipment design and operational organization are closely bound up with volume development of the business. Many of these problems are already in the way of being solved by aircraft design engineers and business administration specialists.

Radically new designs for air freighters were stimulated by war research and at present are being offered on the market. One of the earliest airplanes used extensively was the DC-3. In addition to their regular complement of passengers, these airplanes carried 1,000 pounds of baggage, mail, and express. Converted to freight transport, they carry 5,000 pounds of cargo. Another Douglas plane, the DC-4, converted to military use as a C-54A, carried about 17,000 pounds. The DC-4-1037, cargo version of the preceding, specifically constructed for freight, has a capacity of 22,700 pounds for a 1,500 miles flight. There is a projected version of the DC-4 cargo ship which will be self-refrigerated. Other planes used extensively are the Consolidated C-87, with payload capacity of 10,000 pounds, the Curtiss-Wright C-46, with capacity of 16,000 pounds, and the Martin "Mars" flying boat, with a cargo capacity of about 38,000 pounds. The Fairchild C-82, also adapted to freight transport, carries 16,000 pounds. The Boeing

¹ Brittin, L. H., Ault, B., and Mayhew, R., *Air Freight Potential, Women's Apparel Industry in New York*, 1946.

Aircraft Company has a prospectus out for an all-cargo strato-cruiser, with a payload maximum of 41,000 pounds. This giant cargo plane will be divided into four separate compartments with separate pressurization, refrigeration and temperature control. There has already been some experimentation with gliders towed by tug planes. Some such solution may be offered to handle large volumes of produce cheaply. The development of helicopters would facilitate pickup service from scattered farms. Helicopters could carry such produce to metropolitan centers for trancontinental, consolidated loads. There is little doubt that the ingenuity of American inventors will solve any design problems that arise.

Much of the early experimentation with the air freight was concerned with the problems of refrigeration. The belief of early theorists that high altitude alone would cool and keep produce refrigerated was proved erroneous. It was found that some perishables could be transported if pre-cooled sufficiently but that others needed both pre-cooling and refrigeration in flight. Ingenious, lightweight refrigeration equipment and insulated cargo compartments were designed and installed on converted airplanes. The projected cargo cruisers all provide for refrigeration and temperature control in the basic design.

It was also early discovered that air cargo would have to be specially packaged. Lightweight, insulated packages are now available. These both cut down load weights and preserve the freshness of perishables. Other problems, such as the effect of air pressure variation on certain products like flowers, have been met and solved.

Adequate pickup and delivery for air freight has presented difficulties which have been only partly met to date. Some of the carriers have evolved elaborate teletype systems which enable them to advise consignees of pending deliveries and provide for delivering the goods in either their own or the consignee's trucks. The joint delivery and pickup service provided by Air Cargo, Inc., for certain participating, certificated lines has been mentioned. The largest freight carrier in the United States has recently admitted that better pickup and delivery facilities are the greatest remaining barrier to even more rapid expansion. In California it would seem that there will be need eventually for some integrated pickup and delivery organization. This will be worked out, probably on a trade or aviation area basis, either by a service organization of the competing lines, or by a separate, specialized business company.

The future of the air freight industry in California is dependent to a large degree on the development of adequate airports. Cargo strato-cruisers, with a load capacity of 41,000 pounds may be roaring overhead; California's fertile fields may be teeming with specialty crops at the peak of maturity perfection; the eastern populace may be day dreaming of vitamin-fresh fruits and vegetables; if the cargo planes are unable to land to pick up the produce, air freight will remain only an interesting possibility. More airports are needed at spots where the passenger potential may be comparatively low. Better airports will be needed to accommodate the increasing size of the air freighters.

Some of the estimated potentials of air freight were based on the possibility of a diversion to air of a part of the past rail express and freight. Such procedure is legitimate in assembling data for a projection; actual developments, however, have shown only an infinitesimal diversion from the total volume of surface freight and express; there are strong indications that in the future, air cargo will be made up of many new products, not shipped before, to new markets not available before, with a minimum of competition with surface transportation. Two examples will illustrate the point. Up to the present, practically no fresh spinach has been shipped from California. Specially cleaned and trimmed spinach, packaged in attractive cellophane bags, should find a ready market in the east. In the discussion of flowers as an air cargo candidate it was mentioned that an entirely new market might be opened for lower-priced, field-grown flowers. Retailers, using airplanes to make quick shifts of good sellers and bad sellers, have been attracted by the speed factor alone; there would have been no purpose in making the shift with slower transportation.

The main fact to be kept in mind in considering the air freight industry in California is that air transportation is no longer a theoretical consideration for the future. California's agricultural perishables and industrials are already being flown east; eastern finished consumer's goods are being unloaded at California terminals. It is up to the citizens of California to take full advantage of the opportunity—to search out and establish new and larger markets for their produce in the east, to broaden and better serve local markets with eastern goods, and to do all in their power to provide adequate airports and other facilities so that the rapidly expanding industry can be utilized to the utmost.

5. POSSIBLE FOREIGN DEVELOPMENT

Special Position of California Ports

California's major ports are in a uniquely favored position—both economic and geographical—to take full advantage of developing international air commerce. Los Angeles, San Diego, and San Francisco have become

termini of the Nation's major trancontinental railroads and highways; they already handle a large volume of surface-borne commerce; and they have in position all the complex machinery and facilities necessary for servicing goods in transit. International traffic will

probably lend itself to air transportation to a greater degree than domestic traffic. Goods can be transported to interior South America or Asia by airplane in a matter of days compared to weeks by steamship and railroads, and many of the hazards of water and terrain are eliminated. Within the past decade an ever-increasing volume of commerce of all categories has begun to travel by air rather than by surface, and the State's ports must be fully equipped to handle this custom.

California's ports are natural gateways to a huge trade area, much of it still undeveloped. The Latin American market is constantly expanding, and our trade there is bound to increase, especially since the elimination by the late war of one of our keenest competitors and the temporary crippling of others. Because of the almost insuperable difficulties of railroad construction, airplane transportation has been popular in Latin America from the start. Five years ago our southern neighbors were transporting a volume of air cargo six and one-half times that of the United States for the same period.

The Pacific nations, from the Western Hemisphere to the Orient, from Alaska to the island continents of the Antipodes, are entering a new economic era. These vast lethargic populations in the Pacific Basin were brought into contact with Western ideas and conveniences during the war. Now there are murmurings of discontent with their former position. Soon there will be a new market of millions clamoring for Western produce. The United States is in the best position to

supply this market and a large part of the goods will flow through California ports.

Fundamental concepts of world trade have been changing. Before World War I, the idea of a bilateral exchange between two nations gave way to multilateral world trade, extending and altering the limits of several national economies to one world economy. Since World War II, this world economy theory, as an important policy device of the United Nations, is aimed at removing the causes of wars. California's place in this new world economy is already a high one. Developing the State's ports to handle adequately air exports and imports as they develop will not only be profitable but will support one of the basic aims of American foreign policy—the furtherance of world peace.

Potential Development

Because of arrested development of commercial air transport during the late war and the still disorganized world economy, it is difficult to make any exact estimates of the potential volume of international trade likely to accrue to California ports but data on previous volumes of surface traffic serve to indicate certain trends.

The Bureau of Agricultural Economics has tabulated a selected number of agricultural products exchanged between the United States and other Western Hemisphere countries in 1939. These products were confined to census groups with a large percentage of air candidates. In the listing below the edible animal

EXPORTS FROM CALIFORNIA PORTS TO WESTERN HEMISPHERE COUNTRIES—1939

	Los Angeles		San Diego		San Francisco	
	1,000 lbs.	\$1,000	1,000 lbs.	\$1,000	1,000 lbs.	\$1,000
Edible Animal Products.....	259	79.9	432	84.1	1,506	362.4
Inedible Animal Products.....	475	125.1	66	86.1	386	277.8
Edible Vegetable Products.....	18,533	588.1	8,295	87.9	61,048	2,313.0
Inedible Vegetable Products.....	722	640.6	198	53.8	1,658	655.0
Total.....	19,989	1,433.7	8,991	311.9	64,598	3,608.2

IMPORTS TO CALIFORNIA PORTS FROM WESTERN HEMISPHERE COUNTRIES—1939

	Los Angeles		San Diego		San Francisco	
	1,000 lbs.	\$1,000	1,000 lbs.	\$1,000	1,000 lbs.	\$1,000
Edible Animal Products.....	9,653	629.6	12,797	927.4	876	119.9
Inedible Animal Products.....	108	155.6	2	2.5	60	94.9
Edible Vegetable Products.....	7,133	202.0	68	3.5	3,321	89.7
Inedible Vegetable Products.....	5,495	988.7	145	5.5	4,151	874.6
Total.....	22,389	1,975.9	13,012	938.9	8,408	1,179.1

Source: United States Department of Agriculture, Bureau of Agricultural Economics from United States Bureau of the Census, Foreign Commerce and Navigation of the United States, 1939.

products include live and dressed poultry, eggs, meat and meat products, fish, and sea food. Inedible animal products cover shoes, purses, leather and leather goods, furs, and live animals. Inedible vegetable products embrace drugs, oils, grass or forage and tobacco. The selected tabulation indicates the possible volume of trade with the Western Hemisphere by way of the three principal California ports, a comparison of groups of products, and the relative position of imports and exports.

One of the Wayne University studies in air transport made a careful examination of the volume of drugs and pharmaceuticals likely to move by air. This study was based on 1939 data of surface traffic and the opinions of wholesalers and producers as to the amount of drugs valued at more than 50 cents a pound which might be shipped by air. The conclusions pertinent to California ports follow:

	Gross Water-borne Traffic of Drugs, 1939 (in thousands of ton-miles)		Potential Air Traffic of Drugs (in thousands of ton-miles)	
	Export	Import	Export	Import
South America.....	26,976	10,953	3,998	190
Asia.....	88,666	214,141	9,535	4,675
Oceania.....	18,823	383	1,293	63
Total.....	134,465	225,477	14,826	4,928

Source: Larsen, S. A., and Reitz, W., *Air Cargo Potential in Drugs and Pharmaceuticals*, 1946, pp. 83-84.

A large proportion of traffic in these commodities with the countries selected would pass through California ports. The volume of shipments, impressive as it is, would be augmented to a considerable degree by the inclusion of penicillin, and many serums and vaccines unknown in 1939.

In 1944 the Transportation Unit of the Bureau of Foreign and Domestic Commerce completed a series of studies estimating the air freight potential between the United States and certain Latin American countries. Data of 1939 was again taken as that of the most recent normal year and commodities were chosen because of their value per pound, their perishability, their fragility, and their style factor. It was thought that some of the traffic would be former surface freight, but a large part, and in a short time probably the greater part, would be new business made possible by the use of airplanes. It was estimated that air cargo exports to Argentina, Brazil, Colombia, Peru, Uruguay, and Venezuela would total 106,792,301 pounds or over 290,000 pounds daily. Of these commodities 33.18 percent was high valued, 33.18 percent perishable, 32.72 percent fragile, and .92 percent quickly obsolescent. The estimate of imports into the United States from these countries was much less—31,234,426

pounds. Of this amount 11.34 percent represented goods chosen because of value, 88.41 percent perishables, .20 percent fragile articles, and .05 percent commodities with style factor. These estimated potentials would be shared with other airports in the United States; they are valuable, however, in indicating the possible volume of different classes of commodities which will be handled by the air traffic developing between Latin America and California.

Development to Date

Much of our existent, technical knowledge of flight conditions over the Pacific is the result of army and navy experience during the last war. To make possible a quick victory over Japan, it was imperative to transport as quickly as possible whole depots of war materiel for our own and Allied forces at the battle fronts and adequate food and supplies for the civilian populations backing up the war effort in Alaska, Hawaii, Australia, New Zealand, and the Orient.

Some of this cargo was flown in army and navy aircraft; some of it in private airplanes under contract. At the end of the war, the Army Air Transport Command was averaging over 12 million plane-miles monthly in air transport¹. The volume of this traffic decreased in the first months of peace, but with the increasing demands of reconstruction, Pacific air transport began to burden available facilities.

When it is recognized that one airline company—Pan American—carried more than 18,000 persons in 1946 one way on one schedule—San Francisco to Honolulu—with a newly resumed service, it can be seen that trans-Pacific air commerce is past the pioneering stage. During this same period the Army Air Transport Command and the Naval Air Transport Service were carrying pay passengers. Two former military air transport contractors were carrying both persons and goods, and no less than four other lines were operating chartered, non-scheduled trans-Pacific services.

Established scheduled domestic airlines such as Pan American World Airways, pioneer trans-Pacific carrier, and United Airlines as well as foreign registered companies like Australian National Airways, China National Aviation Corporation, the Dutch KNILM, Pacific Overseas Airlines Siam, Ltd., and Philippine Air Lines are at present all operating their old and new routes to the fullest extent possible with available equipment and facilities. Table 84 lists the California terminals and schedules of both these and non-certificated carriers.

Complete data for non-scheduled trans-Pacific and Latin American service is unavailable. The contract carriers have already, however, carried impressive totals of passengers and freight. When the Matson Navigation Company's application for certificated

¹ *Air Transport of Agricultural Perishables*, United States Department of Agriculture, Miscellaneous Publication No. 585, p. 11.

CALIFORNIA AIRPORTS

TABLE 84
AIR LINES SERVING FOREIGN TRADE THROUGH
CALIFORNIA PORTS

California Terminal	Name of Company	Schedules
San Francisco-----	China National Aviation Corporation ^c ----- Dutch KNILM ^c ----- Matson Line ^b ----- Pan American World Airways ^a ----- United Airlines ^a -----	2 or 3 flights weekly Planning to come to San Francisco Planning to come to San Francisco 1 daily to Hawaii 2 weekly to Philippines via Hawaii 1 weekly to New Zealand via Hawaii 1 daily to Hawaii
Oakland-----	Australian National Airway ^c ----- Cal-Asia ^b ----- Far Eastern Air Transport, Inc. ^b ----- Matson Lines ^b ----- Philippine Air Lines, Inc. ^c ----- Trans-Ocean Air Lines ^b -----	1 weekly, 2 every other week to Australia
Burbank-----	Dutch KNILM ^c ----- Matson Lines ^b -----	
Los Angeles-----	Pan American World Airways ^a -----	2 daily to Mexico 1 daily to Hawaii
Ontario-----	Pacific Overseas Airlines Corporation ^b ----- Pacific Overseas Airlines Siam, Ltd. ^c -----	1 weekly to Siam via Hawaii

^a United States Flag scheduled airline.
^b United States Flag nonscheduled airline.

^c Foreign flag registered airline.

schedules between the West Coast and Hawaii was rejected, the company began experimental contract trips with two DC-4's. The first flight was made between Oakland and Honolulu in July 1946 with a plane load of fresh fish, strawberries, wearing apparel and flowers.¹ The Pacific Overseas Airlines Corporation is one of the largest operators in the Pacific and has had both government and private contracts for passenger and cargo transport. In 1946 the company was flying eight round trips weekly between the United States and Tokyo, and four trips weekly between California and Hawaii for the Army Air Transport Command. It was also flying regular schedules between California and Shanghai for UNRRA. On its first trip to China

the company carried \$100,000 worth of serums and vaccines weighing 10,000 pounds and took two and a half days for the flight.²

The economic structure of the countries of Asia and to a lesser degree, that of Latin America, was completely disorganized by the late war. These nations are now trying to adjust their economies to the demands of peace. If these abnormal conditions are kept in mind, the following tabulation of United States exports by air in 1945 affords some indication of the possible volume of different types of produce which may continue to move by air in international trade:

¹ *American Aviation*, July 15, 1946.

² *Aviation News*—June 3, 1946.

UNITED STATES EXPORTS BY AIR OF MERCHANDISE
BY COMMODITY GROUPS—1945

Commodity Group	Value in Dollars	Percent of Total	Weight in Pounds	Percent of Total
Edible Animal Products-----	\$164,263	.32	113,796	1.02
Inedible Animal Products-----	5,656,656	11.16	306,632	2.76
Edible Vegetable Products-----	41,887	.08	703,148	6.32
Inedible Vegetable Products-----	827,945	1.63	441,678	3.97
Textile Fibers-----	6,788,691	13.39	1,125,970	10.12
Wood and Paper-----	125,380	.25	193,080	1.73
Non-metallic Minerals-----	919,039	1.81	817,518	7.35
Metals-----	1,302,814	2.57	382,239	3.43
Machinery and Vehicles-----	6,817,814	13.45	2,773,947	24.93
Chemicals-----	11,180,628	22.05	1,654,178	14.86
Miscellaneous-----	16,878,740	33.29	2,616,727	23.51
Total-----	\$50,703,857	100.00	11,128,913	100.00

Source: Department of Commerce, Bureau of the Census, *United States Exports by Air of Domestic and Foreign Merchandise, 1945*, Report No. FT 732.

TABLE 85
UNITED STATES EXPORTS OF DOMESTIC AND FOREIGN MERCHANDISE BY AIR
BY SELECTED COUNTRIES OF DESTINATION—1945

Country of Destination	Value in Dollars	Percent of United States Total	Percent of Group Total	Shipping Weight in Pounds	Percent of United States Total	Percent of Group Total
Total All Countries.....	\$50,703,857	100.00	-----	11,128,913	100.00	-----
Mexico.....	12,829,955	25.30	-----	2,706,224	24.32	-----
Central America.....	3,474,284	6.85	100.00	894,591	8.04	100.00
British Honduras.....	12,028	.03	.35	8,370	.08	.93
Canal Zone.....	341,142	.67	9.82	204,222	1.83	22.83
Costa Rica.....	732,050	1.45	21.07	183,368	1.65	20.50
El Salvador.....	218,347	.43	6.28	46,058	.41	5.15
Guatemala.....	437,443	.86	12.59	125,335	1.13	14.01
Honduras.....	142,845	.28	4.11	56,800	.51	6.35
Leeward and Windward Islands.....	21,383	.04	.62	28,836	.26	3.22
Nicaragua.....	244,744	.48	7.04	97,151	.87	10.86
Panama.....	1,324,302	2.61	38.12	144,451	1.30	16.15
Northern and Western South America.....	18,030,429	35.56	100.00	2,699,430	24.26	100.00
Barbados.....	7,786	.02	.04	3,622	.03	.13
Bolivia.....	219,430	.43	1.22	42,340	.38	1.57
Brazil.....	7,916,111	15.61	43.90	753,411	6.77	27.91
British Guiana.....	30,627	.06	.17	15,262	.14	.57
Chile.....	1,171,535	2.31	6.50	116,032	1.04	4.30
Columbia.....	4,652,087	9.18	25.80	729,782	6.56	27.03
Curacao.....	312,802	.62	1.73	82,149	.74	3.04
Ecuador.....	264,336	.52	1.47	61,564	.55	2.28
French Guiana.....	5,547	.01	.03	8,909	.08	.33
Peru.....	868,391	1.71	4.82	149,450	1.34	5.54
Surinam.....	41,709	.08	.23	23,496	.21	.87
Trinidad and Tobago.....	182,520	.36	1.01	129,751	1.17	4.81
Venezuela.....	2,357,548	4.65	13.08	583,662	5.25	21.62
Eastern Asia and Pacific Islands.....	2,196,154	4.33	100.00	745,487	6.70	100.00
Afghanistan.....	109	-----	-----	25	-----	-----
Australia.....	647,048	1.28	29.46	167,122	1.50	22.42
British Malaya.....	546	-----	.03	78	-----	.01
British Oceania.....	42,847	.08	1.95	2,926	.03	.39
Burma.....	14	-----	-----	15	-----	-----
Ceylon.....	31,807	.06	1.45	7,690	.07	1.03
China.....	175,846	.35	8.01	92,906	.84	12.46
French Indio-China.....	3	-----	-----	7	-----	-----
French Pacific Islands.....	783	-----	.04	293	-----	.04
India.....	1,178,868	2.33	53.68	443,495	3.99	59.49
Japan.....	972	-----	.05	254	-----	.03
Netherlands East Indies.....	313	-----	.02	522	-----	.07
New Guinea.....	49,238	.10	2.24	6,300	.06	.85
New Zealand.....	9,727	.02	.44	3,396	.03	.46
Philippine Islands.....	12,156	.02	.55	3,480	.03	.47
Portuguese Asia.....	14	-----	-----	8	-----	-----
S.A.S. East Asia.....	92	-----	-----	189	-----	.03
U.S.S.R.....	45,771	.09	2.08	16,781	.15	2.25

Source: Department of Commerce, Bureau of the Census, *United States Exports by Air of Domestic and Foreign Merchandise, 1945*, Report No. FT 732.

Table 85 lists United States exports by air to certain countries during 1945. Only those countries were selected which are probable customers for goods transported from California; thus, in the South American group, only countries in the north and west were selected. If we recall again the possible abnormality of the year 1945, the table presents comparative volumes

of potential exports for California's customers. By a process of natural economic development international airline service will evolve in accordance with the traffic demand of these various countries.

Monthly totals of the weight and value of air exports and imports for Los Angeles, San Diego and San Francisco during 1946 are given in Table 86. As

TABLE 86

**UNITED STATES EXPORTS OF DOMESTIC AND FOREIGN MERCHANDISE AND GENERAL IMPORTS BY AIR,
BY CALIFORNIA CUSTOMS DISTRICTS, JANUARY-DECEMBER, 1946**

Exports

	United States			Los Angeles		San Diego		San Francisco		United States			Los Angeles		San Diego		San Francisco	
	Value (in dollars)	Value (in dollars)	Percent of U. S.	Value (in dollars)	Percent of U. S.	Value (in dollars)	Percent of U. S.	Value (in dollars)	Percent of U. S.	Shipping Weight (in lbs.)	Shipping Weight (in lbs.)	Percent of U. S.	Shipping Weight (in lbs.)	Percent of U. S.	Shipping Weight (in lbs.)	Percent of U. S.	Shipping Weight (in lbs.)	Percent of U. S.
January.....	5,532,084	51,372	0.9	-----	-----	-----	-----	2,843	0.1	1,015,649	15,601	1.5	-----	-----	-----	-----	1,102	0.1
February.....	3,998,358	57,271	1.4	-----	-----	-----	-----	12,280	0.3	789,488	6,690	0.8	-----	-----	-----	-----	2,498	0.3
March.....	7,695,980	55,571	0.7	-----	-----	-----	-----	19,784	0.3	1,306,595	13,837	1.1	-----	-----	-----	-----	4,703	0.3
April.....	8,753,423	56,227	0.7	-----	-----	-----	-----	32,933	0.4	1,563,028	12,215	0.8	-----	-----	-----	-----	4,831	0.3
May.....	9,217,163	55,697	0.6	-----	-----	-----	-----	17,586	0.2	1,784,728	10,497	0.6	-----	-----	-----	-----	6,204	0.3
June.....	10,576,798	62,873	0.6	-----	-----	-----	-----	69,663	0.7	1,945,241	15,442	0.8	-----	-----	-----	-----	18,081	0.9
July.....	8,281,948	83,434	1.0	-----	-----	-----	-----	102,076	1.2	1,546,619	10,706	0.7	-----	-----	-----	-----	38,749	2.5
August.....	10,527,311	63,716	0.6	1,670	*	-----	-----	16,711	0.2	2,160,486	12,255	0.6	2,057	0.1	-----	-----	10,781	0.5
September.....	11,306,264	114,835	1.0	-----	-----	-----	-----	119,123	1.1	1,950,303	22,339	1.2	-----	-----	-----	-----	26,285	1.3
October.....	11,749,154	159,614	1.4	-----	-----	-----	-----	255,009	2.2	2,642,382	30,084	1.1	-----	-----	-----	-----	36,541	1.4
November.....	12,295,450	98,972	0.8	4,103	*	-----	-----	143,072	1.2	2,567,977	25,859	1.0	6,240	0.2	-----	-----	36,511	1.4
December.....	15,345,751	175,062	1.1	-----	-----	-----	-----	554,165	3.6	3,395,131	22,520	0.7	-----	-----	-----	-----	51,094	1.5
Totals.....	115,279,684	1,034,644	0.9	5,773	*	-----	-----	1,345,245	1.2	22,667,627	198,045	0.9	8,297	*	-----	-----	237,380	1.0

Imports

	United States			Los Angeles		San Diego		San Francisco		United States			Los Angeles		San Diego		San Francisco	
	Value (in dollars)	Value (in dollars)	Percent of U. S.	Value (in dollars)	Percent of U. S.	Value (in dollars)	Percent of U. S.	Value (in dollars)	Percent of U. S.	Shipping Weight (in lbs.)	Shipping Weight (in lbs.)	Percent of U. S.	Shipping Weight (in lbs.)	Percent of U. S.	Shipping Weight (in lbs.)	Percent of U. S.	Shipping Weight (in lbs.)	Percent of U. S.
January.....	4,348,102	205,333	4.7	5,204	0.1	5,348	0.1	149,781	3,599	2.4	316	0.2	158	0.1	-----	-----	-----	-----
February.....	3,712,311	119,236	3.2	-----	-----	-----	-----	143,611	2,332	1.6	-----	-----	-----	-----	-----	-----	-----	-----
March.....	4,946,205	85,660	1.8	14,466	0.3	1,535	*	204,295	3,316	1.6	364	0.2	13	*	-----	-----	-----	-----
April.....	4,647,588	64,350	1.4	-----	-----	2,000	*	237,355	2,006	0.8	-----	-----	10	*	-----	-----	-----	-----
May.....	3,840,050	23,561	0.6	-----	-----	1,265	*	326,293	1,810	0.6	-----	-----	249	0.1	-----	-----	-----	-----
June.....	6,048,288	233,059	3.8	-----	-----	250,344	4.1	589,336	2,717	0.5	-----	-----	162	*	-----	-----	-----	-----
July.....	5,724,657	162,504	2.8	-----	-----	213,557	3.7	865,765	2,591	0.3	-----	-----	996	0.1	-----	-----	-----	-----
August.....	4,936,414	47,156	1.0	-----	-----	-----	-----	1,174,266	1,679	0.1	-----	-----	-----	-----	-----	-----	-----	-----
September.....	4,954,530	60,259	1.2	500	*	11,507	0.2	1,536,945	2,329	0.1	70	*	249	*	-----	-----	-----	-----
October.....	5,434,945	113,109	2.1	877	*	119,256	2.1	496,846	3,495	0.7	148	*	5,745	1.2	-----	-----	-----	-----
November.....	4,683,322	76,746	1.6	1,700	*	98,459	2.1	627,111	10,113	1.6	6,257	1.0	740	0.1	-----	-----	-----	-----
December.....	6,939,153	88,796	1.3	18,005	0.3	69,910	1.0	779,272	3,176	0.4	69,252	8.9	1,805	0.2	-----	-----	-----	-----
Totals.....	60,215,565	1,279,769	2.1	40,752	0.1	773,181	1.3	7,130,876	39,163	0.5	76,407	1.1	10,127	0.1	-----	-----	-----	-----

* Less than 0.05 percent.

Source: United States Department of Commerce, Bureau of

Census, United States Foreign Trade, Trade by Air Summary Reports FT 971.

might be expected so shortly after the war, exports exceeded imports in both weight and value. San Francisco led in air exports; Los Angeles in air imports; San Diego topped its two larger sister ports in the weight of goods shipped into California. During the first postwar year air carriers flew 435,425 pounds of goods from California ports and transported 125,697 pounds of foreign produce into these ports. When it is realized that during this same year the foreign countries were still impoverished, still suffering from the shock of war and still uncertain of their economic future, the need of immediate plans for airports and facilities adequate to handle this international traffic—certain to increase with each year of peace—becomes compelling.

Table 87 presents a comparison of water and air-borne exports and imports for the three principle California ports during 1946. Several facts are apparent at a glance. Bearing out early theorizing, air-borne exports and imports were much higher in value than water-borne exports and imports. San Diego's international commerce by air, compared with its commerce by water, was far greater than that of Los Angeles or San Francisco, and many times the national average. The value of air imports into Los Angeles compared with the value of its imports by ship was 50 percent larger than the like figure for the United States. Up to the present, Los Angeles and San Francisco have diverted a smaller percentage of their international commerce to air than has the United States as a whole.

TABLE 87
COMPARISON OF WATER- AND AIR-BORNE EXPORTS OF DOMESTIC AND FOREIGN MERCHANDISE
AND GENERAL IMPORTS, AT CALIFORNIA PORTS—1946

Exports

	Weight (in pounds)				Pct. Air to Water	Value (in dollars)				Pct. Air to Water
	By Vessel	Pct. of U. S.	By Air	Pct. of U. S.		By Vessel	Pct. of U. S.	By Air	Pct. of U. S.	
United States-----	173,834,500,000	100.	22,667,627	100.	.013	\$7,726,600,000	100.	\$115,279,684	100.	1.492
Los Angeles-----	5,691,000,000	3.3	198,045	0.9	.003	109,600,000	1.4	1,034,644	0.9	.944
San Diego-----	3,800,000	0.0	8,297	0.0	.218	200,000	0.0	5,773	0.0	2.887
San Francisco-----	4,751,000,000	2.7	237,380	1.0	.005	291,200,000	3.8	1,345,245	1.2	.462
Total California Ports--	10,445,800,000	6.0	443,722	2.0	.004	\$401,000,000	5.2	2,385,662	2.1	.595

Imports

	Weight (in pounds)				Pct. Air to Water	Value (in dollars)				Pct. Air to Water
	By Vessel	Pct. of U. S.	By Air	Pct. of U. S.		By Vessel	Pct. of U. S.	By Air	Pct. of U. S.	
United States-----	98,382,600,000	100.	7,130,876	100.	.007	\$3,709,900,000	100.	\$60,215,565	100.	1.623
Los Angeles-----	656,200,000	0.7	39,163	0.5	.006	54,400,000	1.5	1,279,769	2.1	2.353
San Diego-----	30,700,000	0.0	76,407	1.1	.249	700,000	0.0	40,752	0.1	5.822
San Francisco-----	1,129,400,000	1.2	10,127	0.1	.001	209,800,000	5.7	773,181	1.3	.369
Total California Ports--	1,816,300,000	1.9	125,697	1.7	.007	\$264,900,000	7.2	\$2,093,702	3.5	.790

Source: United States Department of Commerce, Bureau of the Census, *United States Foreign Trade, Water-Borne Trade by*

United States Ports, January, 1946-December, 1946, Summary Report FT972 and Trade by Air Summary Reports FT971.

The Future of International Air Commerce

When a new economic development is accepted by private business, which has to show a profit, that economic development may be considered no longer wishful theorizing but sound expectation. The airline companies already engaged in international commerce based in California ports are listed in Table 84. In addition to these, every major United States scheduled airline has either already been granted or is now negotiating for operating certificates which establish a California terminal. The companies already established are occupied with extending and consolidating their routes. Dutch, British, Chinese, Australian, Latin American and French airlines are vying with one another in setting up Pacific Basin and Latin American services which will anchor far-flung routes to California ports.

Developing international air commerce presents special technical, mechanical, and schematic problems which will have to be solved. Such commerce will not mean merely the carriage of passengers, but keen competition for all sorts of cargoes—passengers, mail,

express and even heavy produce. Larger and larger airplanes, with special temperature and humidity control are being planned and manufactured. New techniques of loading and handling will have to be developed. American technological genius will provide for the design and production of new equipment needed; airports must be furnished as soon as possible with necessary facilities to handle the new equipment. Ancient dock-side systems of customs, immigration, agriculture and health examinations must be replaced by a more pliable service, easily transferrable to flights to and from alternate air fields. Weather information and planning are vastly more important in overseas operations than in cross-country flying and such technical service should be improved.

Adequate facilities for California's international air commerce imply major ports designed for both domestic and international travel, scientific traffic control, expert surface handling of equipment, personnel and cargo, and properly planned satellite fields to serve as alternates. Even more important to the future

of this international air commerce than the mechanical and technical handling, is the integration of the State's whole aviation development with the interstate and international progress now in evidence on every hand. The present Master Plan of Airports for California has attempted to make ample provision for intrastate air transportation to the large international air terminals. The importer of tropical fruit and orchids will go out

of business if his shipment spoils between the port of arrival and his place of sale. The businessman using airmail for commercial paper faces serious monetary losses if intrastate air commerce is not on a par with the international service available. The future of international air service for California is inseparably bound with adequate intra and interstate aeronautical development.

PART VI — CONCLUSIONS

1. ANALYSIS OF AREA REQUIREMENTS

As stated in the Foreword of this report its purposes are:

- (1) To record the growth of aeronautics in California;
- (2) To inventory and appraise the existing aeronautical facilities;
- (3) To project aeronautical trends and requirements;
- (4) To specify, in terms of general location and type of development, the projects necessary to anticipate and meet the needs of civil aviation in California, throughout the life of the Federal Airport Program.

The first three objectives have been satisfied in Parts I, IV and V hereof. The recommendations for improvements and necessary new developments have been derived in the several AREA TREATMENTS contained in the Appendices. It now remains to recapitulate those recommendations to express the airport needs of the entire State.

Before doing so, however, it appears desirable to restate the basic considerations under which the conclusions have been reached, both in the Area Treatments and in this summary. They are as follows:

- (1) Certain existing facilities, whether publicly or privately owned, can and will be protected and maintained in perpetuity, and in the absence of positive knowledge to the contrary, these same facilities can be expanded as indicated to meet the needs of the future.
- (2) Other facilities, known to be inadequate and incapable of expansion or development to meet future requirements, will continue in their present role so long as they are useful or justifiable to their owners, but may ultimately cease to be of general utility as airports.
- (3) Private airports, established by individuals for personal use, and affording no facilities for itinerant or commercial aircraft, have not been considered as providing dependable long range accommodations in their localities. Therefore, with but few exceptions, private airports have not been considered when projecting the community's needs. They are, however, valuable adjuncts in the role of emergency landing fields, and accordingly, have been included in the tabulations and maps of Part IV.
- (4) In judging the adequacy of existing facilities the capacities of various classes of airports have been those outlined in Part V, Section 1, under "Development of Airport Requirements", except that in the

projections for Los Angeles County each airport, existing and proposed, has been utilized to maximum capacity.

(5) Airports have been judged by the adequacy of landing facilities alone, as indicated by the definitions of the several classes established by the recommended standards of the Civil Aeronautics Administration. Airports considered adequate may, and in many cases do, lack administration buildings, hangars, parking ramps, taxiways, lighting, fencing and other accoutrements which can be determined only by detailed engineering study beyond the scope of this report. The object has been to consider the problem in its broad aspects and indicate the need for additional facilities to complete a State-wide system or coverage in view of present and projected needs, rather than to dwell upon minute detail which is properly within the province of local management. Such detailed study is recommended to the planning agencies throughout the State. The need therefor has been indicated frequently and clearly during the accumulation of data for this report.

(6) Where two or more airports now serve a locality and improvement of one to a higher classification has been recommended, the selection of the site to be improved is a local problem, contingent upon relative suitability of the sites, land acquisition and development costs and many other considerations which can only be determined by study, negotiation and intensive local planning, far beyond the scope of this study.

Upon these broad principles, and the projections in Part V, *the present and probable future needs of each community of the State have been analyzed* with respect to scheduled aviation, non-scheduled flying and cargo potentialities. The final recommendations in each Area Treatment are assembled here for analysis and comment. They reveal that—

California needs 96 new airports by 1950.

California must improve and enlarge 110 existing airports by 1950.

This program completed will provide 522 civil airports for 1950 with 30 percent total increase in capacity but with that increased capacity where it is most needed.

With this first phase of the program accomplished, the anticipated increases in all branches of civil aviation through 1950 will be adequately accommodated.

But progress must not stop in 1950. Projections indicate increases of from 200 to 300 percent between 1950 and 1955. To anticipate and meet the airport requirements and complete the coverage of the State by 1955 will require:

59 more new airports between 1950 and 1955.

41 existing 1950 airports improved and enlarged.

A net total of 581 civil airports by 1955—

An increase of 42 percent in number over 1946,

An increase of 45 percent in total capacity over 1946.

The distribution of recommended development and improvement among the 14 Areas of the State is presented in the following tabulation. It will be noted that 25 percent of the new airports for 1950 and 31 percent of those for 1955 are recommended for Los Angeles Metropolitan Area 2. The same area also leads in recommended improvements in each interval; in fact, 23.8 percent of all projects recommended relate to this area where, by 1955, almost half of the State's estimated 11,117,500 population is expected to reside. Similarly, the San Francisco Metropolitan Area 9 is allocated 15 percent of the new airports in 1950 and accounts for 9.5 percent of all recommendations, since by 1955 it will possess 26 percent of the State's population:

SUMMARY OF RECOMMENDATIONS
AIRPORT DEVELOPMENT AND IMPROVEMENT—BY AREAS

Area	New Airports		Improve Existing		Total Projects Recommended			Percent of State Total
	By 1950	1950 to 1955	By 1950	1950 to 1955	By 1950	1950 to 1955	Life of Program	
1.-----	9	5	6	4	15	9	24	7.8
2.-----	25	18	15	15	40	33	73	23.8
3.-----	1	1	2	-----	3	1	4	1.3
4.-----	1	-----	5	1	6	1	7	2.4
5.-----	17	2	4	6	21	8	29	9.6
6.-----	8	2	11	1	19	3	22	7.2
7.-----	2	1	4	1	6	2	8	2.6
8.-----	2	2	7	-----	9	2	11	3.6
9.-----	15	1	8	5	23	6	29	9.5
10.-----	2	5	10	3	12	8	20	6.5
11.-----	7	16	15	2	22	18	40	13.0
12.-----	1	1	6	1	7	2	9	2.9
13.-----	2	1	11	-----	13	1	14	4.6
14.-----	4	4	6	2	10	6	16	5.2
State Totals	96	59	110	41	206	100	306	100.00
Program Totals	155		151		306			

As was discussed in Part IV, Areas 2 and 9 present the major problems confronting California in caring for aviation's needs—present and projected. The recommendations mentioned above for these Areas are in recognition of that problem and of the urgency presented by the rapid growth of these two regions of high population density. Area 2 anticipates by 1955 a population increase of 23 percent over 1946, while Area 9 expects a 15 percent increase. Obviously, therefore, urban expansion will jeopardize many suitable airport sites and now is the expedient time for anticipating future requirements in these Areas. The urgency for such planning is greater here than elsewhere in the State where space requirements are not so acute.

In general, the recommendations for new airports and improvements actually fall in reverse order to the overall rank of the several Areas developed in Part IV, Section 5. Those areas ranking highest at present have the fewest recommendations, and those in the lower one-third of the ranking tabulation all move to the upper one-third of the list when Areas are ranked by percentage of the total recommendations. This fact affords a rough confirmation of the method used in establishing the overall rank, and also indicates that the general trend of the recommendations has been in the proper direction.

The same result is obtained when total weighted value of recommended development by Areas is com-

pared to present overall rank. Area and County recommendations have, in each case, served to improve the situation in those localities which presently suffer by comparison to the State average or the desirable balance in aeronautical facilities.

However, as has been pointed out frequently in this report, complete uniformity among the Areas and Counties is neither desirable nor possible, because of the wide variety of conditions prevailing and the need for coverage whether or not local population justifies.

This principle, long recognized in highway construction, is based upon the general good. If, therefore, greater uniformity has been attained by the recommended development designed primarily to complete coverage and render every part of the State accessible to aircraft, the recommendations may be considered basically sound. The actual effect of the recommendations is indicated in the following tabulation. In each case the goal is to approach the State ratio of 1.00 while supplying the local need.

IMPROVED DISTRIBUTION RESULTING FROM RECOMMENDED DEVELOPMENT

Area	1946			1950			1955		
	Population Percent State	Weighted Units Percent State	Ratio Units To Popu- lation	Population Percent State	Weighted Units Percent State	Ratio Units To Popu- lation	Population Percent State	Weighted Units Percent State	Ratio Units To Popu- lation
California.....			1.00			1.00			1.00
Area 1.....	5.04	5.43	1.08	5.18	5.94	1.15	5.22	6.24	1.20
Area 2.....	43.81	16.89	.39	44.63	19.02	.43	45.19	21.00	.46
Area 3.....	1.31	11.80	9.01	1.27	9.43	7.43	1.29	8.56	6.64
Area 4.....	2.06	7.54	3.66	1.99	6.16	3.10	2.00	5.70	2.85
Area 5.....	4.29	8.56	2.00	4.24	8.83	2.08	4.29	8.46	1.97
Area 6.....	4.92	10.13	2.06	4.64	10.03	2.16	4.67	9.31	1.99
Area 7.....	.12	3.09	25.75	.12	3.04	25.33	.12	2.87	23.92
Area 8.....	4.17	6.17	1.48	4.12	5.56	1.35	4.15	5.19	1.25
Area 9.....	26.94	9.54	.35	26.72	10.60	.40	26.01	10.05	.39
Area 10.....	4.14	6.36	1.54	4.03	5.79	1.44	4.03	6.00	1.49
Area 11.....	1.08	4.21	3.90	1.01	5.15	5.10	.96	6.41	6.67
Area 12.....	1.02	4.55	4.46	1.03	3.95	3.83	1.04	3.67	3.53
Area 13.....	.43	2.64	6.14	.41	3.19	7.78	.41	2.97	7.24
Area 14.....	.67	3.09	4.61	.61	3.31	5.43	.62	3.57	5.76

In the foregoing tabulation the ratio for Los Angeles Metropolitan Area 2 has increased from .39 to .46 by virtue of improvements recommended. Area 9 has shown a similar increase from .35 to .39. In both cases the Areas are principally urban and therefore may expect less than one-half of the State's per capita aircraft ownership. On this basis the ratios shown may be considered suitable.

Area 1—San Diego County ratio has risen slightly from 1.08 to 1.20, by reason of Recreational and Forest Service Airports recommended for its mountainous rural areas. The County retains its top-rank position with respect to the State as regards balance in aeronautical development.

Areas 3, 4 and 7, with low population densities, have been recommended for the necessary facilities to complete their coverage, and at the same time their ratio of units of airport to population has been reduced, because existing units are in general adequate for contemplated increases in population and aeronautical activity.

Areas 5, 6, 8, 10 and 12, of medium population densities, and from 60 to 80 percent urban in classification, have been recommended for the necessary develop-

ment to meet contemplated expansion; the facilities for access to recreational areas and the necessary forest service airports have been suggested. At the same time the ratios of units of airports to population in these Areas has been reduced to more nearly conform to desirable standards.

Areas 11, 13 and 14, sparsely settled mountain and forested areas, present a different problem. Here are located many of the scenic attractions of the State not previously accessible to air travelers. Here, too, are California's finest forest areas in need of aerial access for patrol and protection. Consequently, recommended development has in each case slightly increased the ratio of airport units to population. Coverage has been improved materially, the need of each community has been considered carefully and increases have been recommended only where adequately justified by local or general utility.

It is confidently believed that the recommendations contained in the several Appendices, if carried out, will be found adequate to meet the needs of each community, and of the State at large, for eight to ten years in the future. These recommendations for each Area and County are recapitulated in Table 88.

TABLE 88—Continued
PROJECTED AIRPORT IMPROVEMENT AND DEVELOPMENT BY AVIATION AREAS AND COUNTIES

	1950											1955										
	New		Improvement									New		Improvement								
	Class		From— S-1		1		S-2		2		Miscel- laneous	Class		From— S-1		1		S-2		2		Miscel- laneous
	1	2	To— 1	2	2	3	2	3	3	4		1	2	To— 1	2	2	3	2	3	3	5	
Area 9. San Francisco Metropolitan.....	10	3	1	1	2	2	1				3 (below)	1				1		1		2		1 (below)
Alameda.....		1					1													1		
Contra Costa.....	1	1	1													1		1				
Marin.....	2	1																		1		
Napa.....	2											1										
San Francisco.....											1 New 3											
San Mateo.....						2		1														
Santa Clara.....	1			1							1 S-1 to 3											1-3 to 5
Solano.....							1															
Sonoma.....	4										1 New 3											
Area 10.....	1	1	2	2	2		4					4	1			2						1 (below)
Amador.....				1																		
El Dorado.....		1		1																		
Nevada.....			1		1											1						
Placer.....							1						1									
Sacramento.....					1		2					2										
Sierra.....			1													1						
Sutter.....												1										
Yolo.....	1						1															1-S3 to 3
Yuba.....												1										
Area 11.....	6		3	3	3		5				2 (below)	16				1				1		
Del Norte.....	2						1					1										
Humboldt.....	2			2	3		1					8								1		
Lake.....				1			2				1 New 3	4										
Mendocino.....	2		3				1				1-3 to 4	3				1						
Area 12.....	1		1	1			3				1 (below)	1					1					
Butte.....							1					1										
Colusa.....	1		1				1										1					
Glenn.....																						
Tehama.....				1			1				1-3 to 4											
Area 13.....	2		3	2	1		2	3				1										
Lassen.....			1	1			1	1														
Modoc.....	1		2	1				1				1										
Plumas.....	1				1		1	1														
Area 14.....	3	1	1	1	3		1					4			1					1		
Shasta.....	1											2										
Siskiyou.....		1			1		1								1					1		
Trinity.....	2		1	1	2							2										

Source: Area summaries from Appendices 1 to 14, inclusive.

2. AIRPORT NEEDS OF CALIFORNIA CITIES

In the several Area Treatments the present and future airport requirements of California's cities to meet the needs of scheduled and non-scheduled aviation and contemplated Air Cargo development have been analyzed carefully, and suitable recommendations made to supply deficiencies wherever indicated. Those recommendations, pertaining to California's 180 incorporated cities of over 2,500 population, are recapitulated in the following list of "Airports Existing and Proposed at California Urban Places," where they are segregated by the usual census population groups, and also by years 1950 and 1955. All existing civil airports serving the community are listed as "Public" or "Commercial," depending upon whether they are publicly or privately owned. Opposite each city, or locality within a city, is shown the projected new development or improvement to existing airports recommended. The list provides a complete synopsis of all recommendations applying to "Urban" places within the State. Rural Areas are treated similarly in the following Section 3.

In Part I of this report it was pointed out that through the wartime program of airport development in the interest of national defense and as a result of the availability of surplus military airfields, the airport requirements of California's leading cities are reasonably well covered, insofar as the larger airports serving scheduled aviation are concerned. In Section 3 of Part IV, it was stated that airport facilities at all mainline air carrier stops except Merced, Modesto and Red Bluff, met minimum Class 4 requirements. Recommendations contained herein call for improvement of Class 3 airports at Merced and Red Bluff to Class 4 by

1950, and the improvement of the Modesto Class 3 airport to Class 5 by 1950, in anticipation of extensive air cargo traffic. Other existing mainline air carrier stops recommended for early improvement are Los Angeles—Class 4 to 6, and two additional Class 5 airports; Stockton—Class 4 to Class 5 by 1950; Santa Barbara—Class 4 to Class 5 by 1950; Colton (San Bernardino, Riverside)—Class 2 to Class 4 by 1950 and Class 5 by 1955.

As was also pointed out, existing feederline stops have adequate Class 3 or larger airports at all points except Coalinga, San Jose and Dunsmuir. Recommendations include suitable development at each of these cities and at 13 other cities where feederline service has been proposed or where it is deemed desirable. This latter group includes the improvement of existing airports at Del Mar, Oceanside, Fullerton, Brawley, Calexico, Death Valley, Taft and Susanville to Class 3, and the development of new Class 3 airports at Laguna Beach, Colton-Riverside, Hanford, Beckwourth and Alturas. With this development complete every section of the State and every urban center presently more than 25 miles from an existing Class 3 or larger airport will be supplied with suitable air transport, feeder, cargo or charter flight terminals.

Other recommendations affecting California cities are in the interest of present and projected non-scheduled flying activities, for which purpose 12 new Class 1, 26 new Class 2 and 2 new Class 3 airports have been recommended and 32 improvements to Classes 2 and 3 are considered necessary. The complete list of urban recommendations follows:

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS

Places Over 100,000 Population

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Alameda						
†Berkeley.....	100,024			2	2 to 3	
Oakland.....	400,935	5				
Los Angeles						
Long Beach.....	241,109	6				
N. Long Beach.....					2	
E. Long Beach.....					2	
Los Angeles.....	1,805,687	4		4 to 6		
Downtown.....				5		
Lockheed.....			5			
Canoga Park.....			S-1	S-1 to 2		
Northridge.....			1	1 to 2		
Van Nuys.....			5			
Wilmington.....			S-1		S-1 to 2	

† Raised to higher class than indicated by 1940 census on basis of later special census.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued

Places Over 100,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Los Angeles—Continued						
Los Angeles—Continued						
Venice.....				3		
Pacific Palisades.....				2		
Baldwin Hills.....				1		
San Pedro.....					1	
San Fernando Reservoir.....					2	
Sunland.....				2		
Granada.....				2		
Chatsworth Reservoir.....					2	
Calabasas.....					2	
Tarzana.....				2		
Sherman.....				2		
Sepulveda.....				2		
East Chatsworth.....					2	
Sacramento						
Sacramento.....	119,984	5				
Branstetter.....			S-2	S-2 to 2		
Sky Ranch.....			S-2	S-2 to 2		
Fair Oaks-Phoenix.....			1	1 to 2		
East Sacramento.....					1	
South Sacramento.....					1	
Perkins Sky Line.....			1			
Fair Oaks-Sky Nook.....			1			
Capitol Sky Park (in Yolo County).....			1			
West Sacramento (in Yolo County).....				1		
San Diego						
San Diego.....	362,658	8				
Otay-Brown.....		5				
Santee-Gillespie.....		4				
Lakeside Flight Strip.....		1				
San Diego Airpark.....		1				
Peiks.....			S-2			
Gibbs.....			S-2	S-2 to 2		
Hollingsworth.....			1			
San Francisco.....	827,400	7				
Treasure Island.....				3		
Total—7 Places.....	3,857,797					

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued

Places 25,000 to 100,000 Population

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Alameda						
Alameda.....	89,906					Oakland
Contra Costa						
†Richmond.....	93,738			2		
Fresno						
Fresno.....	63,672	6, 3	S-2, S-2, 2, 2			
Kern						
Bakersfield.....	32,807	5, 1	2, 3, 1			

† Raised to higher class than indicated by 1940 census on basis of later special census.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued
Places 25,000 to 100,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Los Angeles						
Alhambra.....	44,013					El Monte
Belvedere.....	37,192					Montebello
Beverly Hills.....	28,217					Los Angeles
Burbank.....	53,899					Lockheed
Glendale.....	96,495		3			
Huntington Park.....	26,648					Compton
Inglewood.....	37,912					Los Angeles
Pasadena.....	98,279			2		Glendale
Santa Monica.....	67,473	4				
South Gate.....	26,945			2		
Orange						
Santa Ana.....	38,015	4				
Riverside						
Riverside.....	43,939		S-2, 2	S-2 to 2		
San Bernardino						
San Bernardino.....	56,193		S-2, 2		S-2 to 2	
San Diego						
†Coronado.....	25,382					San Diego
San Joaquin						
Stockton.....	58,865	4	S-1, S-2, 1	4 to 5		
San Mateo						
†San Mateo.....	26,804		S-1, S-2			
Santa Barbara						
Santa Barbara.....	38,338	4		4 to 5		
Santa Clara						
San Jose.....	80,734	S-1	S-2, S-2	S-1 to 3	3 to 5	
Solano						
†Vallejo.....	42,941		S-1, S-2			
Total—23 Places.....	1,208,407					

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued
Places 10,000 to 25,000 Population

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Alameda						
Albany.....	14,873					Oakland
†Piedmont.....	10,678					Oakland
San Leandro.....	22,903					Oakland
Contra Costa						
†El Cerrito.....	16,624					Oakland
†Pittsburg.....	10,841					Concord
Humboldt						
Eureka.....	17,055	1, 1		1 to 2	1 to 2	

† Raised to higher class than indicated by 1940 census on basis of later special census.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued

Places 10,000 to 25,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Imperial						
Brawley.....	11,718	S-2	S-1	S-2 to 3		
El Centro.....	11,141					Imperial and MCAB
Los Angeles						
†Arcadia.....	15,524			2		
Bell.....	13,742			2		
Compton.....	23,460		2, S-2	S-2 to 3		
†Culver City.....	12,360		S-2			
†Hawthorne.....	10,119	4		2 (New)		
Lynwood.....	15,276				1	
Maywood.....	12,741					Montebello
Monrovia.....	12,807		S-2			
†Montebello.....	13,144		2, 2	2 to 3		
†Monterey Park.....	11,393			2		
Pomona.....	23,539		1, 1		1 to 2	
Redondo Beach.....	17,036					Torrance
†San Fernando.....	11,286		S-2, 2	S-2 to 2		
San Gabriel.....	16,840					El Monte
South Pasadena.....	14,356				2	
Whittier.....	20,113				2	
Marin						
†San Rafael.....	11,389		S-1, S-1			Green Brae
Merced						
Merced.....	10,135	3		3 to 4		
Monterey						
Monterey.....	11,393	4				
Salinas.....	13,512	4				
Napa						
†Napa.....	12,987	4	1			
Orange						
Anaheim.....	12,897		1, 1		1 to 2	
Fullerton.....	12,173	1		1 to 2	2 to 3	
San Bernardino						
†Colton.....	12,717		2	2 to 4	4 to 5	
Ontario.....	19,638	5				
Redlands.....	16,718		1			
San Diego						
†Chula Vista.....	11,081					Otay-Brown
National City.....	17,654		1, 1			
†Oceanside.....	10,698		1	1 to 2	2 to 3	
San Joaquin						
Lodi.....	13,118	3	S-2, S-2			
San Luis Obispo						
†San Luis Obispo.....	11,657	S-2, 3				
San Mateo						
Burlingame.....	17,395					San Francisco
†Daly City.....	11,666					San Francisco
Redwood City.....	14,662					San Francisco
†San Bruno.....	15,173					San Francisco
†S. San Francisco.....	11,406					San Francisco
Santa Barbara						
†Santa Maria.....	10,094	4	1, 2			
Santa Clara						
Palo Alto.....	18,261	1		1 to 3		

† Raised to higher class than indicated by 1940 census on basis of later special census.

CALIFORNIA AIRPORTS

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued
Places 10,000 to 25,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Santa Cruz						
Santa Cruz.....	17,690		1, 1	1 (New)	1 to 2	
†Watsonville.....	10,257	4, S-1				
Sonoma						
Santa Rosa.....	14,931	4	1			
Stanislaus						
Modesto.....	18,403	3		3 to 5		
Ventura						
†Oxnard.....	18,979	4, 4				
Ventura.....	15,701		1		1 to 2	
Total—52 Places.....	751,959					

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued
Places 5,000 to 10,000 Population

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Alameda						
Hayward.....	8,243	5				
Butte						
Chico.....	9,287	6	1, S-2			
Contra Costa						
Antioch.....	7,255		S-1, S-1	S-1 to 1	1 to 2	
Martinez.....	7,381	1				
Fresno						
Coalinga.....	5,026	S-2		S-2 to 3		
†Sanger.....	5,217					Fresno
†Selma.....	5,894		S-2	S-2 to 3		
Imperial						
Calexico.....	5,415	2	1	2 to 3		
Kern						
†Delano.....	6,630	5				
*Wasco.....	5,000	2, S-2				
Kings						
Hanford.....	8,234	1		1 to 3		
Los Angeles						
Azusa.....	5,209					Monrovia
†El Segundo.....	5,625					Los Angeles
Gardena.....	9,319		1	1 to 2 New 2, 1		
Hermosa Beach.....	9,550					Los Angeles
Manhattan Beach.....	9,290			2		
San Marino.....	8,175					Glendale
Torrance.....	9,950	4	1	1 to 2		
Madera						
Madera.....	6,457	4				

() Where bracketed existing airports are in "Private" category.

* Placed in "Urban" category upon basis of special census.

† Raised to higher class than indicated by 1940 census on basis of later special census.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued

Places 5,000 to 10,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Marin						
†Mill Valley.....	6,119					Green Brae
San Anselmo.....	7,125					Green Brae
Monterey						
Pacific Grove.....	8,708					Monterey
Nevada						
Grass Valley.....	5,701		S-1	S-1 to 1		
Orange						
†Huntington Beach.....	5,173	1			1 to 2	
†Laguna Beach.....	6,524			New 2	2 to 3	
†Newport Beach.....	9,396					Santa Ana
Orange.....	9,286					Santa Ana
Placer						
Roseville.....	8,309	1				
Riverside						
Corona.....	9,146		1			
†Palm Springs.....	7,213	6				
San Bernardino						
†Needles.....	5,015	5	1			
Upland.....	7,814					Ontario
San Diego						
†Escondido.....	5,930		(1)	1 to 2	2 to 3	
†La Mesa.....	6,486		1, 1, 1, 2			
San Luis Obispo						
†Paso Robles.....	6,364	4, 2				
San Mateo						
†Menlo Park.....	7,180					San Francisco
†San Carlos.....	6,311		1, 1	1 to 3		
San Joaquin						
Tracy.....	7,499	3, 3				
Santa Barbara						
†Lompoc.....	5,844	S-1	1			
Santa Clara						
Santa Clara.....	6,650					San Jose
†Sunnyvale.....	6,424					Mountain View
Shasta						
Redding.....	8,109	5, 2				
Solano						
†Benicia.....	8,368		1			
Sonoma						
Petaluma.....	9,559		S-1, S-1, 1			
Stanislaus						
†Turlock.....	6,126	2	S-1, S-1			
Tulare						
†Lindsay.....	5,137		S-2			
Porterville.....	6,827	5				
Tulare.....	9,376	1, 1		1 to 2		
Visalia.....	8,904	5, 1	S-2, 1			

See Footnotes, Page 220.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued
Places 5,000 to 10,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Ventura Santa Paula.....	8,986		1, S-2	1 to 2		
Yolo Woodland.....	6,637		S-2, 2	S-2 to 2		
Yuba Marysville.....	7,979	5, 2				
Total—52 Places.....	377,382					

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued
Places 2,500 to 5,000 Population

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Alameda Emeryville.....	2,521					Oakland
Livermore.....	3,622		1			
Butte Oroville.....	4,421	5				
Contra Costa †*Concord.....	3,940	4				
Eldorado Placerville.....	3,064	S-1		S-1 to 2		
Fresno Reedley.....	3,170		1			
Kern Taft.....	3,205	5, 2, 2		2 to 3		
Los Angeles Claremont.....	3,057		1	(in San Bernardino County)		
Covina.....	3,049					Pomona
El Monte.....	4,746		1, 2	1 to 2	2 to 5	Pomona
Glendora.....	2,822					Pomona
La Verne.....	3,092					Pomona
Sierra Madre.....	4,581			2		
Signal Hill.....	3,184					Long Beach
Marin *Fairfax.....	3,005					Green Brae
†*Larkspur.....	2,549					Green Brae
Sausalito.....	4,719					Green Brae
Mendocino Fort Bragg.....	3,235		S-1	S-1 to 1		
Ukiah.....	4,726	3		3 to 4		
Merced †*Los Banos.....	2,770	S-2		S-2 to 2		
Monterey Carmel.....	2,837		S-2	New 1		

See Footnotes, Page 220.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA URBAN PLACES—BY POPULATION GROUPS—Continued

Places 2,500 to 5,000 Population—Continued

County City Locality	Population 1940 or Later Census	Existing Airports By Classes		Recommendations By Classes		Served by —or to be Served by
		Public	Commercial	1950	1955	
Orange						
Brea.....	2,567					Fullerton
†*Seal Beach.....	2,913		S-1		S-1 to 1	
Placer						
Auburn.....	4,013	S-2		S-2 to 2		
Riverside						
Banning.....	3,874	4				Banning
*Beaumont.....	3,016					
†*Blythe.....	3,813	6, 2	1, 1, 2, S-2			
Hemet.....	3,321	1, 1	1			
†*Indio.....	2,553	4	2			
Sacramento						
North Sacramento.....	3,869					Sacramento
San Benito						
Hollister.....	4,875	3				
San Bernardino						
Chino.....	4,204	4				
San Diego						
†*El Cajon.....	3,175		1			
San Joaquin						
†*Manteca.....	3,215		1			
San Mateo						
Hillsborough.....	2,747					San Mateo
Santa Clara						
Gilroy.....	4,388		S-2			
Los Gatos.....	3,597		S-1	S-1 to 2		
Mountain View.....	3,946		S-2			
Sonoma						
Healdsburg.....	2,885		1, 1			
Stanislaus						
Oakdale.....	3,457		1			Modesto
†*Riverbank.....	2,670					
Sutter						
Yuba City.....	4,968					Marysville
Tehama						
Red Bluff.....	3,824	3		3 to 4		
Tulare						
Dinuba.....	4,468		1			
Exeter.....	3,883		1	New 1		
Ventura						
Fillmore.....	3,662		1	New 1		
Total—46 Places.....	162,218					

* Placed in "Urban" category upon basis of special census.

† Raised to higher class than indicated by 1940 census on basis of later special census.

The total effect of recommended airport development at California Urban Places is summarized in Table 89.

A present total of 208 Urban airports is progressively increased to 237 by 1950 and 249 by 1955—a numerical increase of 20 percent. Equivalent increase in theoretical capacity or weighted value begins at the present 1,107 units and progresses to 1,363 in 1950 and 1,460 in 1955—a total increase of 32 percent. The 20 percent numerical increase contemplated will represent, therefore, an actual increase in capacity or usefulness of one-third. The change is apparent in the numerical reductions in Classes S-1, 1 and S-2 totals

with the corresponding increases in Class 2 total from 24 to 70, Class 3 from 12 to 26 and Class 5 from 16 to 22.

Study of Table 89 will also reveal that the greatest increases in airports, both numerically and by weighted value, have been planned for the seven cities of over 100,000 population, where the number is increased by 87 percent and the weighted value by 79 percent. The class of cities ranking second in need of expanded facilities is the 10 to 25,000 group, where a numerical increase of 18 percent and a weighted increase of 38 percent has been recommended.

TABLE 89
PRESENT AND PROJECTED CIVIL AIRPORT FACILITIES OF CALIFORNIA URBAN PLACES, CLASSIFIED BY SIZE

Population Group	Number of Places 1946	Airport Facilities by C.A.A. Class								Totals	Total Weighted Values	Percent increase over Present
		Sub 1	1	Sub 2	2	3	4	5	6 and Over			
100,000 or More.....	7											
Present Airports.....		2	8	4			2	5	3	24	160	
Total Proposed—1950.....		1	8	1	13	2	1	6	4	36	241	51
Total Proposed—1955.....			11	1	19	3	1	6	4	45	286	79
25,000 to 100,000.....	23											
Present Airports.....		4	3	9	5	3	4	1	1	30	166	
Total Proposed—1950.....		3	3	8	9	4	2	3	1	33	192	16
Total Proposed—1955.....		3	3	7	10	3	2	4	1	33	197	19
10,000 to 25,000.....	52											
Present Airports.....		4	17	9	5	4	9	1		49	254	
Total Proposed—1950.....		4	14	6	11	7	11	2		55	319	26
Total Proposed—1955.....		4	11	6	15	9	10	3		58	348	38
5,000 to 10,000.....	52											
Present Airports.....		8	24	8	8	2	3	7	2	62	314	
Total Proposed—1950.....		6	20	5	16	7	3	7	2	66	366	17
Total Proposed—1955.....		6	18	5	16	9	3	7	2	66	376	20
2,500 to 5,000.....	46											
Present Airports.....		4	17	6	6	3	4	2	1	43	213	
Total Proposed—1950.....		1	20	4	11	2	6	2	1	47	245	15
Total Proposed—1955.....			21	4	10	2	6	2	2	47	253	18
Total Urban Places.....	180											
Present Airports.....		22	69	36	24	12	22	16	7	208	1,107	
Total Proposed—1950.....		15	65	24	60	22	23	20	8	237	1,363	23
Total Proposed—1955.....		13	64	23	70	26	22	22	9	249	1,460	32

Source: From List of Airports Existing and Proposed—California Urban Places.

While Table 89 clearly indicates the Urban airport development deemed necessary, and while the following Section deals with recommendations for rural areas, the actual relationship between the two classifications should be pointed out at this juncture. The following tabulation will prove of interest in pointing

up the fact that exactly two-thirds of the recommendations made in this report apply to non-urban places or territory. Similarly, 62.1 percent of the weighted units of airport added by all recommendations fall in the non-urban category. While the total airports resulting, if the program were followed literally to completion,

would favor non-urban territory by 7 percent, the resulting weighted value of airports would be almost exactly equal.

California is approximately 71 percent Urban (Table 37) in population distribution. As was indicated in Part IV, its people own airplanes on the approximate ratio of three per non-urban unit of population to one per urban unit. Therefore, 71 percent urban units might be expected to own 24 aircraft while the remaining 29 percent non-urban units would own 29 aircraft. The result is an even demand for airports between urban and non-urban sections which exactly

matches the final results pointed out in the foregoing tabulation. The distribution of recommended development between urban and non-urban territory appears to be ideal.

The average weighted value per airport shown in the same tabulation indicates that on the average the State's airports would be of Class 2 capacity upon completion of the program, while those of urban places would average slightly higher and those of non-urban category would be only slightly below the State average. This balance would appear desirable in the interest of uniformly *good* facilities throughout the State.

DISTRIBUTION OF RECOMMENDED DEVELOPMENT BETWEEN URBAN AND RURAL PLACES

	Program Totals	Urban Places		Non-urban Places	
		Subtotal	Percent of Total	Subtotal	Percent of Total
New Airports Added.....	155	41	26.5	114	73.5
Weighted Units Added.....	594	194	32.7	400	67.3
Improvements.....	151	62	41.1	89	58.9
Weighted Units Added.....	329	154	46.8	175	53.2
Total Recommendations.....	306	103	33.7	203	66.3
Total Weighted Units Added.....	923	348	37.9	573	62.1
Resulting Total Airports.....	581	249	42.9	332	57.1
Weighted Value—Total.....	2,966	1,460	49.2	1,506	50.8
Average Value per Airport.....	5.10	5.86	-----	4.54	-----

3. AIRPORT NEEDS OF RURAL AREAS

In the preceding Section the favorable relationship between recommended development in urban and non-urban territory was pointed out. The details of recommendations affecting the latter will now be discussed briefly. An important objective of this survey, repeatedly stated, has been to make every section of the commonwealth available to the air traveler and to provide the facilities necessary for both local and transient users of personal or non-scheduled aircraft. To that end the extensive projections of potential aircraft ownership were broken down to each Area, county and judicial township in the State and recommendations justified accordingly wherever possible. At the same time the expressed needs of the California State Division of Forestry and of the United States Forest Service were woven into each local picture, as were the requirements for access by air to California's National Parks and Monuments, its State Parks and Beaches and other important recreational areas. The result has been that most of the non-urban recommendations have been justified on two or more bases. Of the total of 203 recommendations, 177 are justified in part by the needs of local non-scheduled aviation, 114 by the need for

recreational airports in the locality, and 113 by the needs of either Federal or State Forest Services.

Recommended development in non-urban territory includes 88 new Class 1 airports, 24 new Class 2 airports and 2 new Class 3 airports, which together with improvements at 89 locations and other presently existing airports would provide the following totals by 1955 if the program were carried out fully:

Class Sub 1-----	14	Class Sub 4-----	4
Class 1-----	140	Class 4-----	11
Class Sub 2-----	19	Class 5-----	7
Class 2-----	106	Class 6 and over--	4
Class Sub 3-----	5		
Class 3-----	22	Total -----	332
		Weighted Value--	1,506

Net increase numerically over the existing inventory would be 52 percent. Increase in weighted value would equal 61.4 percent.

Actual recommendations contained in Area Treatments are recapitulated in the following listing by Areas of "Airports Existing and Proposed at California Rural Places". In each case the justification is shown by proper code. The information contained in this list is presented in tabular form in Table 90.

NS—Nonscheduled
 FS—Forest service
 R—Recreational
 FP—Feederline, projected

C—Cargo
 AE—Airline, existing
 AP—Airline, projected

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 1					
San Diego					
Jacumba.....	500	1	-----	1 to 2 NS,FS,R	
Borego.....		4	-----	New 2 NS,R	2 to 3 NS,R,C,FP
Del Mar.....	450	1	-----	1 to 2 NS,R	2 to 3 NS,R,C,FP
Descanso.....	275	-----	-----	1 FS	
Fallbrook.....	600	-----	(S-1)	S-1 to 1 NS	
Alpine.....	460	-----	-----	1 FS,NS	
Ramona.....	3,000	2	-----		
Otay.....	275	-----	S-2		
San Ysidro.....	2,500	-----	1		
San Marcos.....	300	-----	1,1		
Potrero.....		-----	-----		1 FS
Capitan Grande.....		-----	-----		1 FS
Poway.....	200	-----	-----	1 FS	
Earthquake Valley.....		-----	-----	2 FS	
Coyote Creek.....		-----	-----	1 FS	
Pauma Indian Reservation.....		-----	-----		1 FS
Rainbow.....		-----	-----		1 FS
Temecula Creek.....		-----	-----		1 FS
Morena Lake.....		-----	-----	2 FS,R	
Cuyamaca.....		-----	-----	2 FS,R	
Palomar Mountain.....		-----	-----	2 FS,R,NS	
Area 2					
Los Angeles					
Newhall.....	1,660	S-3	-----		S-3 to 3 AE,NS,FS
Lancaster.....	2,118	2, 2	1, 1, 1		
Llano.....	125	2	-----		
Palmdale.....	913	6	S-1		
Rosamond.....	490	2	-----		
Artesia.....	5,837	-----	S-2	S-2 to 2, New 2 NS	
*Avalon.....	1,637	-----	2		
Bellflower.....	11,425	-----	1		
Castaic.....		-----	S-2		S-2 to 2 NS
Norwalk.....	3,749	-----	1		
Puente.....	1,648	-----	S-2	S-2 to 2 NS	
Saugus.....	175	-----	1		1 to 2 NS
Point Dume.....		-----	-----	1 NS,R	
*Palos Verdes Estates.....	987	-----	-----		1 NS
Dominguez.....	5,000	-----	-----		2 NS
Santa Fe Springs.....	2,000	-----	-----		2 NS
Pico.....	2,594	-----	-----		2 NS
Watson.....		-----	-----		2 NS
Bassett.....		-----	-----		2 NS
*West Covina.....	1,072	-----	-----		2 NS
Flintridge.....	1,070	-----	-----	1 NS	
Alpine.....		-----	-----	2 NS, FS	
Gorman-Quail Lake.....		-----	-----	2 NS,FS,R	
Area 2					
Orange					
Buena Park.....	2,491	-----	1		
Costa Mesa.....	3,579	-----	S-2		
Cypress.....	797	-----	1		
*La Habra.....	2,499	-----	2		
San Juan Capistrano.....	797	-----	S-1		
Western Riverside					
*Elsinore.....	1,552	-----	S-2, S-1		S-2 to 2 NS,FS,R
Calimesa.....	175	-----	S-1		
Norco.....	1,609	-----	S-1		
*San Jacinto.....	1,718	-----	1		
*Perris.....	1,449	-----	-----		1 NS,FS
Glen Ivy.....		-----	S-1		

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES—Continued

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 2—Continued					
Southwestern San Bernardino					
Fontana.....	4,523	1	1		
Big Bear City.....	813		S-1	S-1 to 1 R, FS	1 to 2 NS, FS, R
Area 3					
Imperial					
*Calipatria.....	1,799	S-4			
*Holtville.....	1,772	5			
*Imperial.....	1,515	S-2	S-1		
Desert Riverside					
Desert Center.....		S-3, 4			
Cathedral City.....	350		2		
Mecca.....	525		S-1		
Anza.....					
Idylwild.....	100			1 R	1 FS, R
Shavers Summit.....		5			
Desert San Bernardino					
Bagdad.....		S-3			
Silver Lake.....		S-3			
Baker.....	125	Dry Lake			
Trona..... Airport in Inyo County.....	1,459				
Daggett.....	150	5			
Twenty-nine Palms.....	719	2			
Rice.....		5			
Barstow.....	2,083		1		
Victorville.....	2,000	4, 4	S-1, S-2, 1		
Yermo.....	300		S-4		
Area 4					
Kern					
Famoso.....	150	2			
Buttonwillow.....	685	S-1		S-1 to 1 NS	
Kernville.....	350	S-1		S-1 to 1 NS	
Lebec.....	250	S-1		S-1 to 1 NS	
Lost Hills.....	200	4			
*Maricopa.....	670	1			
McKittrick.....	200	1			
Randsburg.....	630	S-1		S-1 to 1 NS	
*Shafter.....	1,258	1			
*Tehachapi.....	1,512	3			
Inyokern.....	250		2		
Arvin.....	4,042			1 NS	1 to 3 NS, C
Pond.....		2			
McFarland (Famoso).....	2,120	2			
Richgrove (Jasmine).....	175	2			
Parker.....		2			
Kern.....		4			
Allen.....		2			
Area 5					
Ventura					
Camarillo.....	325		S-2		S-2 to 2 NS
Santa Susana.....	175		1		
Saticoy.....	1,382		S-2		
*Ojai.....	1,622		S-1		S-1 to 1 NS, R
Lockwood Valley.....				1 FS, NS, R	
Santa Barbara					
Carpinteria.....	1,389			1 NS, R	
Cuyama-Maricopa.....	100	1		1 to 2 FS	
Gaviota.....	175			1 NS, R	
Los Alamos.....	225			1 NS	1 to 2 FS, NS
Santa Ynez.....	526			2 FS, NS, R	

* Incorporated places under 2,500 population classed as rural.
 () Where bracketed existing airports are in "Private" category.

CALIFORNIA AIRPORTS

NS—Nonscheduled
 FS—Forest service
 R—Recreational
 FP—Feederline, projected

C—Cargo
 AE—Airline, existing
 AP—Airline, projected

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES—Continued

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 5—Continued					
San Luis Obispo					
Nipomo.....	819		1		
Morro Bay.....	645		S-1	S-1 to 1 NS,R	
Cambria.....	600			1 NS,R	
*Arroyo Grande.....	1,443			1 NS,R	1 to 2 NS,R
Atascadero.....	1,881				1 NS,R
Cholame.....	300			1 NS	
La Panza.....				1 FS,NS	
Sycamore Canyon.....				1 FS	
Monterey					
*King City.....	2,263	3	1		
San Ardo.....				1 NS	
*Soledad.....	861			1 NS,R	
Santa Cruz					
Boulder Creek.....	600		1		
San Benito					
San Benito.....	85			1 FS,NS,R	
Llanada.....	25				1 FS
Area 6					
Fresno					
Huron.....		2, 2, 2			
*Dos Palos.....	1,209	1	S-2		
*Kerman.....	375		1		
*Parlier.....	776		S-2		
Dinkey Creek.....				1 NS,FS,R	
*Firebaugh.....	704				
Mendota.....	1,100			1 NS	
Helm.....	175	2			
Kings					
Avenal.....	3,786		(S-2)	S-2 to 2 NS,FS	
*Coreoran.....	2,092		S-2, 2, 2, 2		
Kettleman City.....	400			1 NS	
*Lemoore.....	1,399	4, 3, 2	(S-1)	S-1 to 1 NS	
Madera					
Bass Lake.....		S-1		S-1 to 2 FS,R	
*Chowehilla.....	1,957				1 NS
Tulare					
Monache.....		S-1		S-1 to 2 NS,FS,R	
Tunnel Meadows.....		S-1		S-1 to 2 NS,FS,R	
Three Rivers.....		S-1		S-1 to 2 NS	
Pixley.....	1,625			1 NS	
Orange Cove.....	555			2 NS	2 to 3 NS,C
Strathmore.....	500		1		
*Woodlake.....	1,146		S-2	S-2 to 2 NS,R	
Kern Canyon.....		S-1			
Templeton Meadows.....		S-1			
Badger.....				2 FS,NS,R	
Springville.....	400			2 FS,NS,R	
Taylor Meadow.....					1 FS,NS
Area 7					
Inyo					
*Bishop.....	1,490	6	1		
Big Pine.....	556	2			
Independence.....	569	S-2			
Manzanar.....		3			
Lone Pine.....	1,056	1		1 to 2 FS,NS,R	

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES—Continued

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 7—Continued					
Olancha.....			1, S-2 (S-2)		S-2 to 2 FS,NS,R
Coso Junction.....					
Death Valley.....	125	S-2		S-2 to 3 FP,NS,R	
Coyote Meadows.....		S-1		S-1 to 2 FS,NS,R	
Darwin.....		S-1, 1			
Trona.....	1,459	S-5			
Mono					
Bridgeport.....	200		(S-2)	S-2 to 2 FS,NS,R	2 FS,NS,R 1 FS,NS,R
Leevining.....					
Mammoth Lake.....					
Alpine					
Markleeville.....	125				1 FS,NS,R
Area 8					
San Joaquin.....		None			
Stanislaus					
Vernalis.....	225	6			1 NS
*Patterson.....	1,109		1		
Waterford.....	752				
Merced					
Snelling.....	350				1 NS
Howard.....		2			
Athlone.....		2			
Potter.....		2			
Calaveras					
San Andreas.....	1,100				S-1 to 1 FS,NS,R
Valley Springs.....	200		S-1		
Tuolumne					
*Sonora.....	2,257	1		1 to 2 FS,NS,R	
Mariposa					
Mariposa.....	628	1		1 to 2 FS,NS,R	1 FS,R 2 FS,NS,R
Coulterville.....	375				
Wawona.....					
Area 9					
San Francisco.....		None			
San Mateo					
Half Moon Bay.....	850	4			S-2 to 3 NS
*Belmont.....	2,257		S-2		
Santa Clara					
*Morgan Hill.....	1,014		S-1		1 NS,FS
Warm Springs.....	1,000		S-2		
San Antonio Creek.....					
Alameda					
Centerville.....	1,846		S-2	S-2 to 2 NS	
Warm Springs (Airport in Santa Clara County)					
Contra Costa					
San Ramon.....	200		S-2		S-2 to 2 NS
*Walnut Creek.....	1,578		S-2		
Brentwood.....	2,569				1 NS
Byron.....	1,000				
Solano					
*Dixon.....	1,134		1		S-2 to 2 NS
*Fairfield.....	1,802		S-2		
*Vacaville.....	2,244		1		
*Rio Vista.....	1,682		1		

* Incorporated places under 2,500 population classed as rural.

() Where bracketed existing airports are in "Private" category.

CALIFORNIA AIRPORTS

NS—Nonscheduled
 FS—Forest service
 R—Recreational
 FP—Feederline, projected

C—Cargo
 AE—Airline, existing
 AP—Airline, projected

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES—Continued

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 9—Continued					
Napa					
*Calistoga.....	1,124		1		
*St. Helena.....	1,758			1 NS,R	
Pope Valley.....	200				1 NS,R
Monticello.....	125			1 NS,FS	
Sonoma					
*Sonoma.....	1,537		1		
Cotati.....	1,000	3 Navy		3 NS,FP,C, R	
Gualala.....				1 NS,FS,R	
Jenner.....	175			1 NS,FS,R	
The Geysers.....				1 FS,R	
Wheatland Fork.....				1 FS	
Marin					
Green Brae—*(Corte Madera).....	1,512			2 NS,FS,R	2 to 3 FP
Bolinas.....	200			1 NS,R	
Point Reyes.....	150			1 NS,R	
Area 10					
Sacramento					
Franklin.....	125	3			
Walnut Grove.....	725		S-2		
Yolo					
*Davis.....	2,421	S-2	S-3		S-3 to 3 CP,NS
*Winters.....	1,133	5			
Clarksburg.....	125		S-2		
Sutter					
Robbins.....	100		1		
Nicolaus.....	100				1 NS
Yuba					
Dobbins-Oregon House.....					1 NS
Sierra					
Calpine.....	300		(S-1)	S-1 to 1 FS,NS,R	1 to 2 FS,NS,R
Nevada					
Truckee.....	696	1		1 to 2 FS,NS,R	
*Nevada City.....	2,445	1			1 to 2 FS,NS,FP,R
Placer					
Blue Canyon.....	100	1			
*Lincoln.....	2,044	3			
Forest Hill.....	225				2 FS,R
El Dorado					
Meyers.....				2 FS,NS, FP,R	
Amador					
*Jackson.....	2,024	S-1		S-1 to 2 FS,NS,R	
Area 11					
Del Norte					
Gasquet.....		S-2		S-2 to 2 FS,NS,R	
*Crescent City.....	1,363	4			
Smith River.....	325			1 FS,NS,R	
Requa.....	250			1 FS,NS,R	
Del Norte State Park.....					1 NS,FS,R

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES—Continued

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 11—Continued					
Humboldt					
*Fortuna.....	1,413	1		1 to 2 FS,NS,R	2 to 3 FS,NS,CP,R
Garberville.....	400	S-1		S-1 to 2 FS,NS,R	
Orleans.....			(S-1)	S-1 to 2 FS,NS,R	
Scotia.....	1,085		S-2	S-2 to 2 FS,NS	
Hoopa.....	150			1 NS	
Orick.....	275			1 FS,NS,R	
Redwood Creek.....					1 FS,NS,R
Korbel.....	300				1 FS,NS,R
Kneeland.....					1 FS,NS,R
Mad River.....					1 FS,NS,R
Larrabee.....					1 FS,NS
Petrolia.....					1 FS,NS
Ettersburg.....					1 FS,NS
Ft. Seward.....					1 FS,NS
Mendocino					
Mendocino (Little River).....	784	4			
Covelo.....	625	S-2		S-2 to 2 FS,NS,R	
*Willits.....	1,625	S-1		S-1 to 1 FS,NS,R	1 to 2 FS,NS,R
Laytonville.....	125		S-1	S-1 to 1 FS,NS,R	
*Point Arena.....	374			1 FS,NS,R	
Boonville.....	525			1 FS,NS,R	
Usal Creek.....					1 FS
Eden Creek.....					1 FS
Comptche.....	125				1 FS
Lake					
Gravelly Valley.....		S-4			
*Lakeport.....	1,490		S-2	S-2 to 2 NS	
Lower Lake.....	175		S-2	S-2 to 2 NS,R	
Upper Lake.....	709		(S-1)	S-1 to 2 FS,NS,R	
Kelseyville.....	300			3 FP,CP,NS,R	
Middletown.....	450				1 R,NS
Reiff.....					1 FS,NS
Clearlake Oaks.....	150				1 FS,NS
Bartlett Springs.....					1 FS
Area 12					
Tehama					
*Corning.....	1,472		S-2	S-2 to 2 NS,FS	
Mineral.....			(S-1)	S-1 to 2 R,FS,NS	
Campbell.....		2			
Vina.....		2			
Kirkwood.....		2			
Butte					
*Gridley.....	2,338		S-2	S-2 to 2 NS	
N.E. Butte County.....					1 NS,R
Artois.....			1		
Glenn					
*Orland.....	1,700	2			
*Willows.....	2,215	4			
Colusa					
*Williams.....	814	S-3	S-2	S-2 to 2 NS,R	
Arbuckle.....	624		(S-1)	S-1 to 1 NS	
*Colusa.....	2,285		S-2		S-2 to 2 NS, R
Stonyford.....	150			1 FS,NS,R	

* Incorporated places under 2,500 population classed as rural.
 () Where bracketed existing airports are in "Private" category.

AIRPORTS EXISTING AND PROPOSED AT CALIFORNIA RURAL PLACES—Continued

Area, County and City	Popula- tion 1940 or Later Census	Existing Airports by Class		Recommendations by Class	
		Public	Commercial	1950	1955
Area 13					
Modoc					
*Alturas.....	2,090	4, S-2		S-2 to 3 FP,R,NS, FS	
Cedarville.....	500	S-1		S-1 to 1 FS,NS,R	
Adin.....	250			1 FS,NS	
Fort Bidwell.....	300		(S-1)	S-1 to 1 NS	
Stronghold.....			(S-1)	S-1 to 2 NS,R	
New Pine Creek.....					1 NS
Lassen					
Amadee.....		5			
Karlo.....		S-3			
*Susanville.....	1,575	S-2		S-2 to 3 FP,FS,NS	
Bieber.....	300	S-2		S-2 to 2 R,NS,FS	
Westwood.....	5,064	S-1		S-1 to 2 FS,NS,R	
Ravendale.....			(S-1)	S-1 to 1 NS	
Plumas					
Chester.....	600	S-2		S-2 to 2 FS,NS,R	
Beckwourth.....	150	S-2		S-2 to 3 FS,NS,R,FP	
Quincy.....	1,126		1	1 to 2 FS,NS,R	
Greenville.....	1,246			1 NS,R	
Area 14					
Shasta					
Delta.....		S-1			
Anderson.....	1,045		1		
*Burney.....	500		1		
Fall River Mills.....	250		1		
Ingot-Round Mountain.....	125			1 NS	
Ono-Platina.....					1 FS,NS
Manzanita Lake-Viola.....					1 NS,FS,R
Siskiyou					
McCloud.....	2,373	S-2			
*Dunsmuir.....	2,359	1		1 to 2 FE,FS,NS,R	2 to 3 FE,FS,NS,R
*Montague.....	463	S-2, 6			
*Fort Jones.....	360	S-2		S-2 to 2 FS,NS,R	
Macdoel.....	150		S-1		S-1 to 2 NS,R
*Dorris.....	863				
Happy Camp.....	300			2 FS,NS,R	
Trinity					
Hayfork.....	400	1		1 to 2 FS,NS,R	
Weaverville.....	739	1		1 to 2 FS,NS	
Trinity Center.....			(S-1)	S-1 to 2 FS,NS,R	
Junction City.....	400		(S-1)	S-1 to 1 NS	
Salzer.....				1 NS,R	
Lewiston.....	200				1 NS,R
Island Mountain.....					1 FS,NS,R
Hyampom.....				1 NS,R	

* Incorporated places under 2,500 population classed as rural.
() Where bracketed existing airports are in "Private" category.

The foregoing list and Table 90 indicates the extent to which the three considerations of non-scheduled aviation's needs, recreational opportunities or Forest Service requirements have entered into the justification of proposals in each county and Area, and also indicates the distribution of proposed non-urban airports throughout the State.

The needs of each community which shows a potential of 25 or more aircraft by 1955 have been supplied.

Of 133 locations recommended by the Forest Services this survey has concurred in and recommended development of 104 projects, 16 of which are justified only for access to forest areas. For the 29 other sites recommended by the Forest Services it has been found expedient to depend upon nearby facilities useful for other purposes. In 19 of those cases, suitable airports have been recommended in the vicinity. In planning to supply the requirements of the Forest Service it has

been possible in 107 of 123 cases to base recommendations on two or more of the justifications mentioned above.

Access to National Parks, National Monuments, State Parks and Beaches has been given special consideration. Recommendations include two or more points of easy access to each of California's four National Parks. In each case a Class 2 or larger development is recommended.

While the urgency for airport development in rural or non-urban territory is not comparable to that existing in urban areas where suitable airport sites are disappearing rapidly, it is again pointed out that aero-

autical development cannot attain its potentialities until rural as well as urban areas are adequately covered by good airports. Such airports need not be prohibitive in first cost nor upkeep, especially if that cost is spread over the broadest possible base as is done in highway construction. Only by adopting similar policies toward airports can the needs of non-urban areas throughout the State be adequately supplied. It is vital to the future of aviation that a method be found to accomplish that objective.

The recommendations contained herein are considered adequate to the needs of each non-urban community or political subdivision of California.

TABLE 90
PROPOSED NONURBAN AIRPORT DEVELOPMENT FOR RECREATIONAL AND FOREST SERVICE USAGE
BY AVIATION AREAS AND COUNTIES—1950 AND 1955

Area County	1950					1955					Total Rural After Devel- opment (1955)
	Proposed Development		Recommended to Serve			Proposed Development		Recommended to Serve			
New	Impr.	Non- schedule	Recre- ation	Forest Service	New	Impr.	Non- schedule	Recre- ation	Forest Service		
California.....	67	65	119	83	77	47	24	58	31	37	332
Area 1. San Diego.....	9	3	6	6	9	5	2	2	2	5	23
Area 2. Los Angeles Metropolitan.....	5	3	7	3	3	8	5	13	2	4	44
Los Angeles.....	5	2	7	2	2	7	3	10		1	
Orange.....											
West Riverside.....						1	1	2	1	2	
SW San Bernardino.....		1		1	1		1	1	1	1	
Area 3. Desert.....	1			1		1			1	1	24
Imperial.....											
Riverside.....	1			1		1			1	1	
San Bernardino.....											
Area 4. Kern.....	1	4	5				1	1			18
Area 5.....	13	2	13	9	6	2	4	5	3	2	25
Monterey.....	2		2	1							
San Benito.....	1		1	1	1	1				1	
San Luis Obispo.....	5	1	5	3	2	1	1	2	2		
Santa Barbara.....	4	1	4	3	2		1	1		1	
Santa Cruz.....											
Ventura.....	1		1	1	1		2	2	1		
Area 6.....	7	7	13	7	7	2	1	3		1	34
Fresno.....	2		2	1	1						
Kings.....	1	2	3		1						
Madera.....		1		1	1	1		1			
Tulare.....	4	4	8	5	4	1	1	2		1	
Area 7.....	2	4	6	6	5	1	1	2	2	2	18
Alpine.....						1		1	1	1	
Inyo.....		3	3	3	2		1	1	1	1	
Mono.....	2	1	3	3	3						

CALIFORNIA AIRPORTS

TABLE 90—Continued

PROPOSED NONURBAN AIRPORT DEVELOPMENT FOR RECREATIONAL AND FOREST SERVICE USAGE
BY AVIATION AREAS AND COUNTIES—1950 AND 1955

Area County	1950					1955					Total Rural After Develop- ment (1955)
	Proposed Development		Recommended to Serve			Proposed Development		Recommended to Serve			
	New	Impr.	Non- schedule	Recre- ation	Forest Service	New	Impr.	Non- schedule	Recre- ation	Forest Service	
Area 8.....	2	3	4	5	5	2		2			12
Calaveras.....		1	1	1	1						
Mariposa.....	2	1	2	3	3						
Merced.....						1		1			
San Joaquin.....											
Stanislaus.....						1		1			
Tuolumne.....		1	1	1	1						
Area 9. San Francisco Metropolitan	12	3	13	8	7	1	2	2	1		26
Alameda.....		1	1								
Contra Costa.....	1		1				1	1			
Marin.....	3		3	3	1		1				
Napa.....	2		2	1	1	1		1	1		
San Francisco.....											
San Mateo.....		1	1								
Santa Clara.....	1		1		1						
Solano.....		1	1								
Sonoma.....	5		3	4	4						
Area 10.....	1	3	4	4	4	3	3	5	3	3	17
Amador.....		1	1	1	1						
El Dorado.....	1		1	1	1						
Nevada.....		1	1	1	1		1	1	1	1	
Placer.....						1			1	1	
Sacramento.....											
Sierra.....		1	1	1	1		1	1	1	1	
Sutter.....						1		1			
Yolo.....							1	1			
Yuba.....						1		1			
Area 11.....	7	11	18	15	14	16	2	14	10	15	37
Del Norte.....	2	1	3	3	3	1		1	1	1	
Humboldt.....	2	4	6	4	5	8	1	9	5	9	
Lake.....	1	3	4	3	1	4		3	3	1	
Mendocino.....	2	3	5	5	5	3	1	1	1	4	
Area 12.....	1	5	6	3	3	1	1	2	2		15
Butte.....		1	1			1		1	1		
Colusa.....	1	2	3	2	1		1	1	1		
Glenn.....											
Tehama.....		2	2	1	2						
Area 13.....	2	11	13	9	9	1		1			17
Lassen.....		4	4	2	3	1		1			
Modoc.....	1	4	5	3	3						
Plumas.....	1	3	4	4	3						
Area 14.....	4	6	11	7	5	4	2	6	5	4	22
Shasta.....	1		1			2		2	1	2	
Siskiyou.....	1	2	4	3	2		2	2	2	1	
Trinity.....	2	4	6	4	3	2		2	2	1	

Source: Tabulation of airports, existing and proposed at California rural places.

4. EFFECT OF PROPOSED DEVELOPMENT

In analyzing the total effect of the airport development recommended herein, recourse is again taken to the method of weighting various classes of airports in proportion to their theoretical capacity to accommodate private aircraft, and also serve the needs of scheduled aviation. The values assumed are purely arbitrary. It has never been possible to accurately determine the capacity of any specific airport; hence, it is obviously impossible to specify a capacity for any class of airports. Therefore, the weighting method employed in this report represents an arbitrary measuring device for which purpose it serves satisfactorily. Since weighted values represent the only possible method of comparing unlike articles, the use of that method as a measure of the relative capacities or usefulness of the several classes of airports is considered proper. The weighting factors are repeated for use in the following tables and discussion:

<i>Class</i>	<i>Value (Factor)</i>
Sub 1	2
1	3
Sub 2	4
2	5
3	8
4	10
5 and over	12

Upon this basis California's present 409 Civil Airports (Table 54) have a weighted value of 2,043 units. Each unit is equal roughly to a theoretical capacity for accommodating 25 aircraft. Whether this figure be considered too high or too low makes little difference in the final objective sought—a method of comparing varying numbers of unlike articles.

Reference is made to Table 91 which shows in Column 1 the weighted value of existing Civil Airports in each Area and County of the State (as determined in Column 4 of Table 55). Column 2 applies the theoretical capacity of 25 aircraft per unit of weight to the weighted value of airports for a "Reckoned (or theoretical) Weighted Capacity". Column 3 (from Table 60) supplies the October, 1946 registration of aircraft by Areas and Counties. Column 4 provides a ratio of existing aircraft to existing capacity. This affords a new measuring device for comparison of the aeronautical status of Areas and Counties as of 1946, and a base for comparing the results of the recommended changes.

Continuing the reference to Table 91, Column 5 shows the weighted value of the system of airports which would result if all of the 206 recommendations made for the 1947-1950 interval were carried out. Again the "Reckoned Capacity" of these units is found in Column 6 and the projected aircraft ownership (as derived in Table 73) completes Column 7. The ratio of

projected aircraft to projected capacity in Column 8 provides a scale for comparison to Column 4, and to the State average in Column 8, since as previously explained, it is desirable that each Area and County maintain the nearest possible relationship to the State average.

Repeating the process for 1955 projections and 100 additional recommendations produces a new ratio in Column 12 which provides a basis for comparison of the final outcome of the program with the existing situation—assuming that projections will be approximated in the interval.

Comparing the ratios in Columns 4, 8 and 12 it develops that in every case the theoretical capacity of the airports is being utilized more fully in each succeeding instance. It is also noted that all ratios more nearly approximate the State average in 1955 than in 1946. This is particularly true in County ratios. In Column 4 only 18 counties were within 50 percent, plus or minus, of the State average. In 1955 the number is 24.

In Column 4 only 18 Counties and 4 Areas were utilizing more than one-tenth of their theoretical airport capacity. In Column 12, representing the fruition of the recommended program, 47 Counties and 10 Areas are to be found in that bracket, and 13 Counties indicate a use of more than one-half of the theoretical capacity.

Table 91, therefore, indicates that the proposals contained in this report are logical and well founded and that it is entirely possible, through careful and orderly planning, to achieve a reasonable balance between aeronautical demand and supply. To proceed without such a plan and objective may prove both foolish and extravagant.

The net result of the recommended program in new and improved facilities is apparent also from the following tabulation:

<i>Airport Classes</i>	<i>1947 Inventory of Airports</i>	<i>1955 Airports—As Recommended</i>	<i>Percent Increase</i>
Sub 1	52	27	—48
1	123	204	66
Sub 2	81	41	—49
2	57	177	211
Sub 3	7	5	—29
3	18	48	167
Sub 4	3	3	--
4	34	34	--
Sub 5	1	1	--
5	22	28	27
6 and over	11	13	18
State Totals	409	581	42.1
Total Weighted Value	2,043	2,966	45.2
Average Weighted Value	5	5.1	

CALIFORNIA AIRPORTS

TABLE 91
PRESENT AND PROPOSED CIVIL AIRPORT FACILITIES AND CAPACITIES
BY AVIATION AREAS AND COUNTIES, 1946, 1950, 1955

Area County	1946				1950				1955			
	Weighted Units of Airport, Table 55	Reckoned Weighted Capacity*	Registered Aircraft October, 1946, Table 60	Ratio of Aircraft to Capacity	New Total, Including Units Projected, Weighted	Reckoned Weighted Capacity*	Aircraft Projected, Table 73	Ratio of Aircraft to Capacity	New Total, Including Units Projected, Weighted	Reckoned Weighted Capacity*	Aircraft Projected, Table 73	Ratio of Aircraft to Capacity
Column	1	2	3	4	5	6	7	8	9	10	11	12
California.....	2,043	51,075	7,200	.141	2,661	66,525	19,100	.287	2,966	74,150	44,400	.599
Area 1. San Diego.....	111	2,775	524	.189	158	3,950	1,180	.299	185	4,625	2,757	.596
Area 2. Los Angeles Metropolitan.....	345	8,625	3,838	.445	506	12,650	9,388	.742	623	15,575	22,031	1.415
Los Angeles.....	218	5,450	3,327	.610	365	9,125	8,310	.911	462	11,550	19,505	1.689
Orange.....	41	1,025	189	.184	48	1,200	432	.360	59	1,475	1,012	.686
West Riverside.....	36	900	140	.156	37	925	258	.279	41	1,025	604	.589
S.W. San Bernardino.....	50	1,250	182	.146	56	1,400	388	.277	61	1,525	910	.597
Area 3. Desert.....	241	6,025	140	.023	251	6,275	292	.046	254	6,350	688	.108
Imperial.....	40	1,000	75	.075	47	1,175	155	.132	47	1,175	364	.310
Riverside.....	103	2,575	44	.017	106	2,650	86	.032	109	2,725	200	.073
San Bernardino.....	98	2,450	21	.009	98	2,450	51	.021	98	2,450	124	.051
Area 4. Kern.....	154	3,850	136	.035	164	4,100	392	.096	169	4,225	915	.217
Area 5.....	175	4,375	388	.089	235	5,875	951	.162	251	6,275	2,233	.356
Monterey.....	37	925	92	.099	46	1,150	222	.193	46	1,150	519	.451
San Benito.....	8	200	1	.005	11	275	15	.055	14	350	36	.103
San Luis Obispo.....	32	800	38	.047	48	1,200	92	.077	53	1,325	213	.161
Santa Barbara.....	36	900	117	.130	54	1,350	271	.201	56	1,400	635	.454
Santa Cruz.....	19	475	18	.038	22	550	72	.131	24	600	169	.282
Ventura.....	43	1,075	122	.113	54	1,350	279	.207	58	1,450	661	.456
Area 6.....	207	5,175	403	.078	267	6,700	953	.142	276	6,900	2,225	.322
Fresno.....	83	2,075	193	.093	97	2,425	491	.202	97	2,425	1,146	.473
Kings.....	45	1,125	37	.033	55	1,375	103	.075	55	1,375	244	.177
Madera.....	12	300	9	.030	15	375	38	.101	18	450	89	.198
Tulare.....	67	1,675	164	.098	100	2,500	321	.128	106	2,650	746	.282
Area 7.....	63	1,575	40	.025	81	2,025	63	.031	85	2,125	142	.067
Alpine.....									3	75	2	.027
Inyo.....	63	1,575	40	.025	72	1,800	61	.034	73	1,825	136	.075
Mono.....					9	225	2	.009	9	225	4	.018
Area 8.....	126	3,150	193	.061	148	3,700	583	.158	154	3,850	1,359	.353
Calaveras.....	2	50	6	.120	3	75	13	.173	3	75	31	.413
Mariposa.....	3	75	3	.040	13	325	8	.025	13	325	18	.055
Merced.....	37	925	65	.070	40	1,000	128	.128	43	1,075	297	.276
San Joaquin.....	51	1,275	58	.045	53	1,325	252	.190	53	1,325	591	.446
Stanislaus.....	30	750	60	.080	34	850	170	.200	37	925	395	.427
Tuolumne.....	3	75	1	.013	5	125	12	.096	5	125	27	.216

TABLE 91—Continued
PRESENT AND PROPOSED CIVIL AIRPORT FACILITIES AND CAPACITIES
BY AVIATION AREAS AND COUNTIES, 1946, 1950, 1955

Area County	1946				1950				1955			
	Weighted Units of Airport, Table 55	Reckoned Weighted Capacity*	Registered Aircraft October, 1946, Table 60	Ratio of Aircraft to Capacity	New Total, Including Units Projected, Weighted	Reckoned Weighted Capacity*	Aircraft Projected, Table 73	Ratio of Aircraft to Capacity	New Total, Including Units Projected, Weighted	Reckoned Weighted Capacity*	Aircraft Projected, Table 73	Ratio of Aircraft to Capacity
Column	1	2	3	4	5	6	7	8	9	10	11	12
Area 9. San Francisco Metropolitan.....	195	4,875	884	.181	282	7,050	3,826	.543	298	7,450	8,640	1.160
Alameda.....	31	775	207	.267	37	925	1,020	1.103	40	1,000	2,304	2.304
Contra Costa.....	25	625	71	.114	34	850	260	.306	37	925	591	.639
Marin.....	4	100	12	.120	15	375	71	.189	18	450	155	.344
Napa.....	16	400	7	.017	22	550	42	.076	25	625	93	.149
San Francisco.....	12	300	164	.547	20	500	1,308	2.616	20	500	2,904	5.808
San Mateo.....	26	650	174	.268	40	1,000	390	.390	40	1,000	924	.924
Santa Clara.....	29	725	167	.230	41	1,025	443	.432	45	1,125	1,003	.892
Solano.....	23	575	56	.097	24	600	174	.290	24	600	395	.658
Sonoma.....	29	725	26	.036	49	1,225	118	.096	49	1,225	271	.221
Area 10.....	130	3,250	359	.110	154	3,850	835	.217	178	4,450	1,940	.436
Amador.....	2	50	1	.020	5	125	10	.080	5	125	22	.176
El Dorado.....	4	100	5	.050	12	300	21	.070	12	300	49	.163
Nevada.....	8	200	9	.045	11	275	23	.084	13	325	57	.175
Placer.....	18	450	31	.069	19	475	67	.141	24	600	156	.260
Sacramento.....	41	1,025	199	.194	45	1,125	481	.428	51	1,275	1,106	.867
Sierra.....					1	25	2	.080	3	75	4	.053
Sutter.....	3	75	28	.373	3	75	65	.867	6	150	155	1.033
Yolo.....	37	925	53	.057	41	1,025	97	.095	44	1,100	231	.210
Yuba.....	17	425	33	.078	17	425	69	.162	20	500	160	.320
Area 11.....	86	2,150	29	.013	137	3,425	120	.035	190	4,750	262	.055
Del Norte.....	14	350			21	525	4	.008	24	600	9	.015
Humboldt.....	27	675	16	.024	46	1,150	67	.058	73	1,825	147	.081
Lake.....	16	400	4	.010	29	725	13	.018	41	1,025	31	.030
Mendocino.....	29	725	9	.012	41	1,025	36	.035	52	1,300	75	.058
Area 12.....	93	2,325	148	.064	105	2,625	292	.111	109	2,725	684	.251
Butte.....	35	875	50	.057	36	900	115	.128	39	975	271	.278
Colusa.....	13	325	33	.102	18	450	57	.127	19	475	129	.272
Glenn.....	18	450	28	.062	18	450	57	.127	18	450	137	.304
Tehama.....	27	675	37	.055	33	825	63	.076	33	825	147	.178
Area 13.....	54	1,350	78	.058	85	2,125	130	.061	88	2,200	302	.137
Lassen.....	27	675	18	.027	36	900	38	.042	36	900	84	.093
Modoc.....	16	400	20	.050	28	700	36	.051	31	775	89	.115
Plumas.....	11	275	40	.145	21	525	56	.107	21	525	129	.246
Area 14.....	63	1,575	40	.025	88	2,200	95	.043	106	2,650	222	.084
Shasta.....	28	700	22	.031	31	775	48	.062	37	925	116	.125
Siskiyou.....	29	725	15	.021	37	925	42	.045	43	1,075	93	.087
Trinity.....	6	150	3	.020	20	500	5	.010	26	650	13	.020

* Note: Reckoned weighted capacity is an arbitrary indication of the number of aircraft which might be accommodated by the

weighted units of airport. Each unit is assumed to be able to accommodate 25 aircraft.

It will be noted that the number of sub-standard airports has been reduced by approximately 47 percent overall and that the largest increases are in Class 1 and 2 airports suitable for non-scheduled aviation. Class 3 airports have been increased in number to care for existing and projected feederlines, while Class 5 and larger airports show a very nominal increase. The resulting list is entirely in keeping with the needs pointed out throughout this study.

In planning airport development to meet the diverse requirements of the 14 Areas and 58 Counties of Cali-

fornia which are under consideration in this study, it has been necessary to treat development and judge results somewhat in relationship to population density. When Areas are grouped in high, medium and low population density groups, as in the following tabulation, the recommended developments definitely tend to improve uniformity in each group, and to a lesser degree, in all Areas. It will be noted that ratios have been improved in each instance and that percentages of increase in the Areas vary in proper manner to improve uniformity throughout the State.

	Population Density Factor	Weighted Units of Airport Per 10,000 Population*			Ratio—Aircraft to Weighted Units of Airport—Present and Projected		
		1946	1955	Pct. Incr.	1946	1955	Pct. Incr.
California -----	1.00	2.19	2.67	21.9	3.52	14.97	325.3
Areas having from 5 to 10 times State Average Population Density							
Area 2—Los Angeles...	9.63	.84	1.24	47.6	11.17	35.36	216.6
Area 9—San Francisco	6.05	.78	1.03	32.1	4.50	28.99	544.2
Areas having from ½ to 2 times State Average Population Density							
Area 1—San Diego ---	1.86	2.36	3.18	34.7	4.72	14.90	215.7
Area 5—Mid Coastal...	.51	4.37	5.26	20.4	2.22	8.96	303.6
Area 6—Fresno Met....	.53	4.51	5.32	18.0	1.94	8.06	315.5
Area 8—Stockton Met..	.68	3.24	3.34	3.1	1.53	8.82	476.5
Area 10—Sacra. Met....	.72	3.37	3.98	18.1	2.76	10.90	294.9
Areas having less than ½ the State Average Population Density							
Area 3—Desert -----	.07	19.78	17.76	-10.2	.58	2.71	367.2
Area 4—Kern -----	.39	8.02	7.59	-5.4	.88	5.41	514.8
Area 7—Inyo-Mono --	.013	54.85	65.38	19.2	.64	1.67	160.9
Area 11—Redwood E....	.18	8.49	17.84	110.1	.34	1.38	305.9
Area 12—Chico-R. B....	.23	9.78	9.40	-3.9	1.59	6.25	293.1
Area 13—Modoc Plat....	.06	13.45	19.51	45.1	1.44	3.43	138.2
Area 14—Shasta Cas....	.079	10.01	15.41	53.9	.63	2.09	231.7

* One weighted Unit of Airport equals the theoretical airport capacity for 25 airplanes.

As a fitting close to this study which has endeavored quite seriously to accomplish the objectives enumerated in the Foreword and restated in the opening paragraph of Part VI, it is pointed out that preparation of an Airport Plan for the State of California is only the first step toward actual achievement. This report covers estimated airport needs during the next eight to ten years, and indicates the facilities that should be developed to meet those needs. The report will prove futile without a development program to translate its recommendations into reality. Such a program must have State-wide leadership, counsel and direction. Methods must be found to apportion the costs of ade-

quate airports on a broader and more equitable basis. Airports, once constructed, must be maintained against encroachment by physical obstructions to flight and protected against unfair usage of the legal processes of injunction or damage claims. Suitable sites for the airports of the future must be acquired while yet available at reasonable cost, and be preserved and protected to meet ultimate needs. The exercise of foresight is particularly appropriate.

Planning and action to maintain California's pre-eminent position in aeronautics is respectfully recommended to the citizens and responsible public officials of the State.

APPENDIX 1

AREA 1—SAN DIEGO COUNTY

NATURAL CHARACTERISTICS

Area 1, comprised solely of the County of San Diego, is one of the three most densely populated centers of the State of California. As the southernmost county of the West Coast, it is a principal shipping point for goods bound for Latin America and one of the nearest gateways to the Far East.

Geography and Topography

The San Diego Metropolitan Area is bounded on the north by Orange and Riverside Counties, on the east by Imperial County, on the south by Mexico, and on the west by the Pacific Ocean. A complex topography results from the broad, irregular Peninsula Mountain Range which runs north and south and rises to occasional peaks over 6,500 feet in elevation. The coastal range, averaging 10 miles in width, merges into a moderately high foothill region, and this, in turn, is succeeded by the higher crests and peaks in the eastern part of the county.

Several short rivers—the Santa Margarita, San Luis Rey, San Dieguito, San Diego, Sweetwater and Cottonwood—rise in the mountains and follow courses which they have cut through the Peninsular Ranges to the sea. The principal agricultural centers lie along these river valleys. Many of these rivers have been dammed to supply the cities with water.

Land Usage

From the following tabulation of land usage in the Area it is apparent that over one-third of the land is in

farms although only about one-eighth of this is under actual cultivation. (From Table 15)

Land in Crops-----	113,471 acres
Idle Cropland -----	130,950 acres
Woodland and all other	705,044 acres
Other Private Land---	479,321 acres

Total Privately Owned----- 1,428,786 acres

National Forests and Parks -----	271,534 acres
Other Public Lands---	1,024,800 acres

Total Publicly Owned----- 1,296,334 acres

Total Land in Area 1----- 2,725,120 acres

Climate

The climate of the Area is very mild along the coast, but becomes more variable with the increasing elevation of the mountains to the eastward, and changes to typical desert temperatures and aridity east of the mountains. San Diego's climate has been instrumental in the County's development, attracting settlers and favoring the production of a wide range of crops including semi-tropical fruits and winter grown vegetables. Most of the rainfall occurs from December to March and gradually increases from the coastal plain to the mountains. The following table indicates the average temperature and rainfall along the coastal plain (From Table 14) :

Source: United States Department of Agriculture, Weather Bureau.

Station	Elevation (feet)	Average Rainfall (inches)	Average January Temperature		Average July Temperature	
			Low	High	Low	High
Escondido-----	750	16	36°	65°	55°	89°
San Diego-----	87	10	47°	62°	62°	72°

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

Economically considered, the San Diego Metropolitan Area occupies a high position both nationally and within the State. There is sound evidence of wealth among the rapidly growing population. Basic industries are expanding and offer a large potential of products

adapted to air transport—vegetables, fruits, flowers, fish, clothing, and airplane parts. San Diego ranks as the State's fourth largest market and the airplane transportation of goods from the East Coast for local consumption should be heavy. The Area is also an

importing and exporting center and aeronautical development must be planned with this consideration in mind.

Agriculture

Agriculture is a major industry in the Area. A favorable climate with a growing season of 365 days permits the maturing of many crops—such as semi-tropical fruits—found in no other section of the country. In many instances, rapid maturing makes several crops possible within one year, thus leading to out of season sales at premium prices. The principal crops are oranges, lemons, avocados, and a variety of vegetables such as tomatoes, celery, green beans, squash, peppers, and peas. In 1940 San Diego led the State in avocado production. The following table of carloads of produce shipped from the Area in 1945 shows the diversity of crops harvested:

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	San Diego
Beans (Snap & Lima).....	9
Cabbage.....	105
Cantaloupes.....	1
Cauliflower.....	26
Celery.....	982
Cucumbers.....	8
Grapefruit.....	67
Grapes.....	90
Lemons.....	2,036
Lettuce & Romaine.....	3
Mixed Citrus Fruit.....	171
Mixed Vegetables.....	4
Oranges & Satsumas.....	1,652
Tomatoes.....	173
Total.....	5,327

Source: *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

A large variety of flowers are grown commercially. In 1946 the industry totaled \$1,430,000. It employed over 2,000 people in 200 nurseries. The air transport of flowers has already been proved feasible and the local growers should find a greatly expanded market when air express is better developed.

In 1929 San Diego ranked 57th in value of farm income among the 3,000 odd counties of the United States; at present, it ranks 21st.

The next few years should witness a steady growth in the air transportation of perishables from San Diego. Estimates of possible air freight tonnages in 1950 and 1955 will be given later.

The following tabulation indicates that the cash farm income of Area 1 increased 142.93 percent between 1940 and 1945, compared with an increase for California of 165.48 percent and an increase for the United States of 149.08 percent.

Fishing

Commanding prominence in the Area's industries today is the catching and marketing of sea food. Large quantities of tuna, lobster, and other species are found along the San Diego coast and landed for canning, freezing, and selling fresh. In 1943 the catch amounted to 11,042,135 pounds, 10 percent of the State total.¹ The value of fresh fish taken in 1945 was \$3,088,922; the value of fish for canning and processing \$10,686,400.² With new markets made possible by air transport the take of fresh fish could be increased considerably. San Diego is also a center for deep sea sport fishing for tuna, baracuda, marlin, and other varieties. Aircraft will prove useful to both commercial fishermen and sportsmen for sighting runs of fish.

¹ State of California Department of Natural Resources *Thirty-eighth Biennial Report of the Division of Fish and Game*.
² *Master Airport Plan*, County of San Diego, December, 1946.

GROSS CASH FARM INCOME 1940 AND 1945
(From Table 40)

	1940			1945			Percent Increase 1940 to 1945
	Cash Farm Income	Percent of California	Percent of United States	Cash Farm Income	Percent of California	Percent of United States	
	(Thousands of Dollars)			(Thousands of Dollars)			
United States.....	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
San Diego.....	17,000	2.53	.20	41,298	2.31	.20	142.93

Source: California Crop and Livestock Reporting Service.
 United States totals from *Statistical Abstract of the United States*, 1946.

Lumber Production

Much of San Diego is wooded and Cleveland National Forest contributes considerably to the beauty of the scenery. In 1945 it was estimated that lumber stands in the County equaled 245,000,000 board feet and that 17, 150,000 board feet of this was available for cutting.¹ In this same year two mills were active and 406,000 board feet of lumber was cut for the market.² In order to guard these forests from fire hazards the Federal and State forestry services have requested airport facilities as follows:

¹ California Forest and Range Experiment Station, *Forest Survey Release No. 4, March 1, 1946.* (Table 23.)

² United States Department of Agriculture Forest Service, California Forest and Range Experiment Station, *Forest Research Notes, No. 50.* (Table 23.)

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 1—San Diego

San Diego County

1. Class 1 at Coyote Creek—State Division of Forestry
2. Class 1 at Campo—State Division of Forestry
3. Class 1 at Banner—State Division of Forestry
4. Class 1 at Potrero—State Division of Forestry
5. Class 1 at Descanso—State Division of Forestry
6. Class 1 at Santa Ysabel—State Division of Forestry
7. Class 1 at Alpine—State Division of Forestry
8. Class 1 at Temecula Creek—State Division of Forestry
9. Class 1 at Capitan Grande Ind. Res.—State Division of Forestry
10. Class 1 at Pauma Indian Reservation—State Division of Forestry
11. Class 1 at Poway—State Division of Forestry

12. Class 1 at Rainbow—State Division of Forestry
13. Class 1 at Ponto—State Division of Forestry
14. Class 2 at Julian—United States Forest Service
15. Class 2 at Palomar Mountain—United States Forest Service
16. Class 2 at Cuyamaca Lake—United States Forest Service
17. Class 2 at La Posta (Moreno Lake)—United States Forest Service
18. Class 2 at Escondido—United States Forest Service
19. Class 2 at Jacumba—United States Forest Service

The State Division of Forestry will use the following Airports in their present condition:

- | | |
|------------------------|---------------------------|
| 1. Jacumba | 15. Escondido |
| 2. Pine Valley | 16. Miramar |
| 3. Half Hill Dry Lake | 17. La Mesa |
| 4. Ocotillo | 18. Ream Field |
| 5. Borego Springs | 19. Pala Indian Res. |
| 6. Clark Dry Lake | 20. San Marcos |
| 7. Warm Springs | 21. San Diego |
| 8. Lawson Valley | 22. Del Mar |
| 9. Ramona | 23. San Onofre |
| 10. Santa Maria Valley | 24. Oceanside |
| 11. Jamacha | 25. Santa Margarita Creek |
| 12. El Cajon | 26. Las Flores |
| 13. Otay Resort | |
| 14. Valley Center | |

The United States Forest Service will use San Diego (Lindbergh) Field in its present condition.

Mineral Production

The following tabulation shows the value of minerals produced in San Diego from 1930 to 1945. The main production is stone, sand, salt, and clay, although some gold, silver, bromine, granite, and magnesias is found.

VALUE OF MINERAL PRODUCTION IN SAN DIEGO

Year	Mineral Production	Percent of California	Percent of United States	Percent Change from Preceding Period
1930.....	\$1,303,047	.36	.03	-----
1935.....	471,387	.18	.01	—63.82
1940.....	845,207	.25	.02	79.30
1945.....	1,142,350	.24	-----	35.16

Source: *Minerals Yearbook Review of 1940, California Division of Mines Bulletins*, California State Chamber of Commerce.

Manufacturing

San Diego has advanced rapidly as a manufacturing center since the beginning of the century. Between 1939 and 1943 it rose from 79th to 28th place in the country as an industrial city. The Area's industries—especially aircraft construction—were greatly stimulated by the war. With the return of peace there was some recession but San Diego's position as one of the State's main industrial areas remains unchanged.

In 1939 the value of goods manufactured in the Area

was \$41,821,822—1.49 percent of the State total.¹ In 1945 the estimated value of manufactured products was \$500,000,000.² The factories employed 32,000 workers and the payroll was \$80,000,000. Airplane construction was still the leading industry, followed by clothing and food manufacture, fish packing, and shipbuilding. Books, magazines, chemicals, and wood, iron, stone, clay, and glass products are also important manufactures.

¹ United States Census of Manufacturers.

² *Master Airport Plan*, County of San Diego.

The Area should develop a high industrial air freight potential. It has already been proved that aircraft parts, clothing, books, magazines, and certain chemicals can be shipped profitably by air.

Tourist and Travel Industry

Thousands visit San Diego annually, attracted by the pleasant climate, beautiful forests and parks, famous hotels, and opportunities for sport—especially deep sea fishing. The Area also benefits from the streams of tourists entering Mexico. Cleveland National Forest and Cabrillo National Monument are special points of interest. The volume of visitors to State Parks in the Area during 1946 is shown in the following tabulation:

VISITORS TO CALIFORNIA STATE PARKS—1946
(From Table 18)

	Number of Visitors
Anza Desert.....	27,036
Carlsbad Beach.....	5,000
Cuyamaca Rancho.....	81,728
Mission Bay.....	20,000
Palomar Mountain.....	6,148
San Pasqual Battlefield.....	15,000
Silver Strand.....	Navy
Total.....	154,912

Source: California Department of Natural Resources, Division of Beaches and Parks.

San Diego has numerous military and naval establishments and the possibility of viewing the fleet induces many to visit the Area. In the near future large numbers of these tourists will arrive and depart by airplane.

Transportation and Distribution

Transportation facilities for the Area have scarcely kept pace with its population and industrial growth. Despite a 100 percent increase in population, a 230 percent increase in farm income, and a 1,000 percent increase in the value of manufactured products over a period of five or six years, transportation facilities have increased but slowly. Adequately planned air transportation can be of great service to the community.

At present, the Santa Fe Railway runs six passenger trains daily between Los Angeles and San Diego and two freight trains daily eastward. There is also direct transcontinental connection eastward by the San Diego and Arizona Eastern Railroad linked to the Southern Pacific and Rock Island Railroads.

The El Camino Real Highway follows the coastline into Mexico and Highway No. 395 offers an alternate

route northward. Highway No. 80 runs eastward to the Imperial Valley. Available bus service is shown in the following table:

Daily from San Diego to:

Los Angeles and points north.....	81
El Centro and points east.....	18
Riverside and San Bernardino.....	3
Total.....	102

The bulk of passenger travel is by privately owned automobiles. The latest highway check, that of July 15, 1946, showed daily vehicular traffic on highways leading into San Diego as follows:

U. S. Highway — No. 101	140,518
U. S. Highway — No. 395	16,857
U. S. Highway — No. 80	77,650
To Mountain Areas.....	15,774

On an average, 570 passengers travel each day by train; 2,960 by bus; and 652,397 by automobile.

The present status of commercial air transport will be considered later in detail.

The port of San Diego is one of the world's best natural harbors. There are two municipal piers and other public wharves with 10,840 feet of berthing space, and private wharves with 10,670 feet of space. San Diego is one of the nearest gateways to Latin America and the Far East. Trade with Mexico, and the western coast of Central and South America is bound to increase. Interchange of products with Asia, the Pacific Islands, and Australia is now being investigated and planned. During 1946 water-borne imports and exports totaled 34,500,000 pounds valued at \$900,000. Principal imports in the past have been rubber, tin, ore, copra, raw silk, cane sugar, burlap, jute, wood, tea, pine-apples, coffee, hides, and molasses. Exports have included cotton, aircraft parts and accessories, citrus fruits, rice, copper, gypsum, iron and steel products, industrial machinery, fertilizers, canned fish, and clays.

An airport master plan for San Diego should consider the possibilities of an increasing percentage of this foreign trade moving by airplane. Adequate provision should also be made for international passenger service.

Indices of Purchasing Power

Table 92, listing various indices of purchasing power, reflects the amount of individual wealth in the San Diego Metropolitan Area compared with the State average. It should be noted that the Area ranked first in 1945 in the volume of per capita retail sales. *Sales Management*, in recent years, has placed San Diego at the top or near the top of all American cities in buying potential. The Area therefore should prove a good market for sales of private planes.

TABLE 92
INDICES OF PURCHASING POWER FOR AREA 1
Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
San Diego.....	\$115,738	2.72	\$220,950	4.01	\$267,419	3.72	\$329,813	3.80

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
San Diego.....	\$198,936	\$688	85.68	\$543,605	\$1,146	83.41	66.57

Per Capita Assessed Valuation ^c—1930, 1935, 1940, and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
San Diego.....	\$278,043,620	\$1,326	73.79	-----	\$205,798,290	\$829	76.12	—37.48
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
San Diego.....	\$221,461,643	\$765	74.06	—7.72	\$327,971,815	\$1,321	94.09	72.68

Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
San Diego.....	77,471	.37	102.78	-----	85,253	.34	97.14	—8.11
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
San Diego.....	112,603	.39	98.00	14.71	137,705	.29	93.55	—25.64

TABLE 92—Continued
 INDICES OF PURCHASING POWER FOR AREA 1
 Per Capita Retail Sales^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
San Diego-----	\$115,348	\$550	97.17	-----	\$94,069	\$379	98.96	—31.09
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
San Diego-----	\$120,707	\$417	90.46	10.03	\$338,378	1,169	158.19	180.34

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Population

Table 93 shows the population of the Area by five year periods from 1930 to 1955. The increase in population in San Diego has been immense and the process was accelerated by rapid industrialization during the war. Between 1930 and 1945 San Diego's population grew more rapidly than that of any other aviation area

TABLE 93
 POPULATION OF AREA 1 BY FIVE-YEAR PERIODS
 1930-1955

	Population	Percent of California	Increase over Preceding Period
1930 ^a San Diego-----	209,659	3.69	-----
1935 ^b San Diego-----	248,290	4.08	18.43
1940 ^c San Diego-----	289,348	4.19	16.54
1945 ^d San Diego-----	474,500	5.22	63.99
1950 ^e San Diego-----	514,900	5.18	8.51
1955 ^f San Diego-----	581,000	5.22	12.84

Source: ^a and ^c United States Census (From Table 34).

^b Midpoint of California Taxpayers' Association Estimate for January 1, 1935, and January 1, 1936.

^d Midpoint of California Taxpayers' Association Estimate for January 1, 1945, and January 1, 1946 (From Table 34).

^e and ^f Midpoint of high and low estimates. *Estimated Range for Population Growth in California to 1960*, State Reconstruction and Reemployment Commission 1946. (From Table 34.)

in the State. During the war, thousands of military and naval personnel were stationed in the Area. Even with the return of peace, it is expected that these forces will continue in the neighborhood of 100,000. This opinion is supported by a special census of San Diego taken in March of 1946. At that time the decrease from war peak totals was only 40,000 or about 10 percent, but was still 78 percent above 1940 totals. The population of incorporated and unincorporated cities in the Area is given in Table 94.

In the tables referred to, military and naval personnel are excluded. Actually, an appreciable amount of air travel and airplane ownership can be anticipated among the individuals of the armed forces. This fact should be kept in mind in estimating airport needs and private plane market potentials for the Area.

The overall aeronautical needs of Area 1 should start with the premise that San Diego is an importing and exporting center—important now and destined to become much more important. San Diego is also a metropolitan consuming market, and west-bound airplanes from the east coast should experience no difficulty in finding full plane loads. The Area's agriculture and industries produce many perishables and specialties suitable for air freight—vegetables, fruit, flowers, fish, clothing, and airplane parts. The population includes many wealthy retired people and a large military and naval force—both likely to be interested in air passenger service. The Area is one of the tourist centers of the State and a crossroads for tourist traffic. There should be adequate airport facilities and air passenger service to meet the requirements of these thousands of visitors and supplement the existing means of transportation. These aeronautical needs will now be considered in detail.

TABLE 94
POPULATION STATISTICS OF AREA 1
Incorporated Places

Aviation Areas, Counties Cities	Date Incor- porated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 1.....		35,090	61,665	112,248	209,659	289,348	†460,000	
San Diego County.....		35,090	61,665	112,248	209,659	289,348		
*Chula Vista.....	1911			1,718	3,869	5,138	11,081	June 6, 1944
*Coronado.....	1890	935	1,477	3,289	5,425	6,932	25,382	June 5, 1945
East San Diego.....				4,148	Annexed to San Diego			
El Cajon.....	1912			469	1,050	1,471	3,175	May 8, 1945
*Escondido.....	1888	755	1,334	1,789	3,421	4,560	5,930	June 3, 1946
*La Mesa.....	1912			1,004	2,513	3,925	6,486	May 4, 1945
*National City.....	1887	1,086	1,733	3,116	7,301	10,344	17,654	May 22, 1945
*Oceanside.....	1888	330	673	1,161	3,508	4,651	10,698	June 11, 1945
*San Diego.....	1850	17,700	39,578	74,683	147,995	203,341	362,658	Feb. 21, 1946

* URBAN—1940.

† Estimate of California Taxpayers' Association.

a Imperial County formed from part of San Diego County in 1907.

Unincorporated Places

San Diego County		San Diego County—Continued	
Alpine.....	460	Leucadia.....	285
Bonita.....	125	Lincoln Acres.....	1,006
Bonsall.....	100	North Island.....	1,200
Bostonia.....	1,398	Ocean Beach.....	900
Boulevard.....	450	Otay.....	275
Campo.....	525	Pala.....	250
Cardiff.....	509	Palm City.....	720
Carlsbad.....	3,750	Pine Valley.....	175
Crafton.....	100	Point Loma.....	500
Del Mar.....	450	Poway.....	200
De Luz.....	175	Ramona.....	3,000
Descanso.....	275	Rancho Santa Fe.....	500
Encanto.....	1,280	San Luis Rey.....	375
Encinitas.....	2,500	San Marcos.....	200
Fallbrook.....	600	San Onofre.....	100
Grossmont.....	200	Santee.....	750
Imperial Beach.....	285	San Ysidro.....	2,500
Jacumba.....	500	Solano Beach.....	450
Jamul.....	325	Spring Valley.....	1,051
Julian.....	300	Sunnyside.....	175
La Jolla.....	5,000	Valley Center.....	500
Lakeside.....	2,500	Vista.....	895
Lemongrove.....	3,300		

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

Similar to other California coastal regions, the topography of Area 1 contributes to the concentration of airports along the coastal plain. A broad mountain chain rises from the coastal region to heights of over 6,000 feet and then descends on the east into desert valleys on the rim of the Great Colorado Basin. A few

airports are located in these eastern valleys. Operating facilities for small aircraft are numerous but only one commercial facility serves this entire Area, namely, Lindbergh Field. Following is a classified table of operating airports in San Diego County:

Plate M-1 Code	City and Airport Name	Ownership	Class
SAN DIEGO			
1-1	San Diego—North Island NAS	U. S. Navy	5
1-2	San Ysidro—Ream Field NAAS	U. S. Navy	4
1-3	San Diego—Rosedale NOLF	U. S. Navy	-
1-4	Miramar—Camp Kearney MCAS	U. S. Navy	5
1-5	Miramar—Miramar NOLF	U. S. Navy	1
1-6	La Mesa—Sweetwater NOLF	U. S. WAA	2
1-7	Jacumba—Jacumba NOLF	U. S. WAA	1
1-8	Borego—Clark's Dry Lake NOLF	U. S. WAA	4
1-9	Borego—Borego NOLF	U. S. Navy	1
1-10	Borego—Ocotillo Dry Lake NOLF	U. S. Navy	1
1-11	Oceanside—Camp Pendleton MCOLF	U. S. Navy	5
1-25	San Diego—Lindbergh Field	City of San Diego	8
1-26	San Diego—San Diego Airpark	City of San Diego	1
1-27	Del Mar—Del Mar Airport	County of San Diego	1
1-28	Ramona—Ramona Flight Strip	County of San Diego	2
1-29	Santee—Gillespie Field	U. S. Navy	4
1-30	Otay—Brown Field	U. S. Navy	5
1-31	Lakeside—Lakeside Flt. Strip	City of San Diego	1
1-50	San Diego—Peiks	Commercial-Private	S-2
1-51	San Diego—Gibbs	Commercial-Private	S-2
1-52	San Diego—Hollingsworth	Commercial-Private	1
1-53	San Diego—Gillies Flt. Strip	Private	-
1-54	National City—Hawn Bros.	Commercial-Private	1
1-55	National City—South Bay	Commercial-Private	1
1-56	Otay—Palm City—Wolfe's Airpark	Commercial-Private	S-2
1-57	San Ysidro—Borderland	Commercial-Private	1
1-58	La Mesa—Adams	Commercial-Private	1
1-59	La Mesa—La Pressa	Commercial-Private	1
1-60	La Mesa—Fletcher Flt. Strip	Private	-
1-61	La Mesa—Sweetwater Spgs. Air Ranch	Commercial-Private	1
1-62	La Mesa—Jamacha	Private	1
1-63	El Cajon—El Cajon	Commercial-Private	1
1-64	Ramona—Ramona	Private	S-1
1-65	Escondido—Engel	Private	1
1-66	San Marcos—San Marcos Valley	Commercial-Private	1
1-67	San Marcos—McCormick	Commercial-Private	1
1-68	Oceanside—Hi Hi Sky Ranch	Commercial-Private	1
1-69	Oceanside—Oceanside Airport	Private	S-2
1-70	Fallbrook—San Luis Rey Ranch	Private	S-1
1-71	Fallbrook—Shearer's Ranch	Private	S-1
1-72	Valley Center—Happyland Sanitarium	Private	-
1-73	Rincon—Garrett Ranch	Private	1
1-74	Warners Hot Springs—Warners	Private	S-2
1-75	Julian—Banner Flt. Strip	Private	-
1-76	Borego—Fletcher Flt. Strip	Private	-
1-77	Vallecitos—Campbells Ranch	Private	-
1-78	Pine Valley—Morris Ranch	Private	-
1-79	Campo—Martins Flt. Strip	Private	-

Three major airlines serve Area 1 at present. American Airlines has its western terminal at Los Angeles and 14 flights to and from the east stop at San Diego daily. United Air Lines operates six daily schedules from San Diego to Seattle, serving numerous cities along the coastwise route. All connections for eastern points must be made at San Francisco, United Air Lines' western terminal. Western Air Lines operates 5 schedules daily between San Diego and Los Angeles. One of these takes a circuitous route with stops at El Centro and Palm Springs. An origin and destination table is given below:

It was noted earlier that commercial air service is limited to San Diego alone in Area 1 and Lindbergh Field is taxed with the combined operations of all three airlines. In addition, an average of 30 itinerant and 45 local flights are handled daily.

Other airline companies anticipate using Lindbergh Field facilities in the near future. Among those who

ORIGIN AND DESTINATION—CITY OF SAN DIEGO

Primary Origin or Final Destination	Daily Arrivals	Daily Departures
Fort Worth	1	1
El Centro	1	1
Los Angeles	11	11
Nashville	1	1
Newark	1	1
New York	4	5
Philadelphia	1	-
Reno	1	-
San Francisco	3	1
Seattle-Tacoma	1	4
Total daily flights	25	25

already have applications pending before the Civil Aeronautics Board is Southwest Airways Company, proposing to extend its service from Los Angeles to San Diego with intermediate stops at Del Mar and Oceanside. Another, Eastern Airlines, proposes a fifth transcontinental route originating at Miami, Florida. From San Diego, a feeder operation is offered for consideration, making stops at Oceanside, Santa Ana and Los Angeles. Future developments may also include trans-Pacific operations and increased service to Baja California, Mexico, Central and South America.

The rapidly increasing volume of commercial air activity is well illustrated by a comparison of the 1940 and 1945 quantities of outgoing air mail. The 1940 total was 104,023 pounds compared with 964,454 pounds in 1945, a gain of 827 percent in five years.* Commercial airline companies serving San Diego reported 113,641 on and off passengers for 1945 and 155,959 for 1946—a growth of 37 percent in the last year.

* Source: *Master Airport Plan*, San Diego County.

ESTIMATES OF SCHEDULED AIR TRAFFIC

The estimate of air passenger potential in 1950 and 1955 was developed by apportioning projected 1950 and 1955 California passenger movements to the population within a 25 mile radius of San Diego. On this basis Area 1 can expect 202,259 commercial air passengers in 1950 and 296,861 in 1955. Converting these

totals into daily schedules, it is apparent that 33 in and out daily passenger schedules will be required in 1950 and 48 in 1955.

An analysis of the 1945 volume of agricultural perishables by carlot shipment discloses the 1950 and 1955 potential shown below:

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

County	Commodity	1945		1950		1955	
		Car-loads*	Tons	Percent @7¢†	Tons	Percent @5¢†	Tons
San Diego-----	Beans (Snap and Lima)-----	9	90	10	9.0	50	45.0
	Cabbage-----	105	1,260	2	25.2	7	88.2
	Cantaloupes-----	1	11	2	.2	8	.9
	Cauliflower-----	26	312	0	-----	6	18.7
	Celery-----	982	11,784	0	-----	7	824.9
	Cucumbers-----	8	88	2	1.8	13	11.4
	Grapes-----	90	1,530	1	15.3	5	76.5
	Lettuce and Romaine-----	3	36	6	2.2	18	6.5
	Mixed Vegetables-----	4	48	0	-----	6	2.9
	Tomatoes-----	173	2,249	23	517.3	43	967.1
	Total-----	1,401	17,408	-----	571	-----	2,042

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945*.
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

	Days in Normal Growing Season	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day One-half Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day One-half Growing Season
1950 Total-----	365	571	229	1	50	1
1955 Total-----	365	2,042	817	4	180	1

Source: Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

The following conclusions are reached by converting the totals in the above table into actual aircraft schedules:

The daily average of projected DC-3 and DC-4 air

freight schedules is one in 1950 and three in 1955. If estimated passenger schedules are added to these, the total commercial in and out flights required daily will be 34 in 1950 and 51 in 1955.

PRIVATE FLYING ESTIMATES

Current private plane per capita ownership, combined with the economic buying potential developed in the State treatment indicates that owners of private planes will total 1,180 in 1950 and 2,757 in 1955. A

distribution of these figures to judicial townships on the basis of population, combined with average rental is presented below:

SAN DIEGO COUNTY

Township	Percent	1950	1955	Township	Percent	1950	1955
Borego.....	.01			National.....	12.85	152	354
El Cajon.....	2.98	35	82	Oceanside.....	2.18	25	60
Encinitas.....	.48	6	13	Ramona.....	.36	4	10
Escondido.....	.83	10	23	San Diego.....	79.90	943	2,203
Fallbrook.....	.15	2	4	Vista.....	.21	2	6
Jacumba.....	.05	1	2				

AIRPORT REQUIREMENTS

As was pointed out in Part IV of the body of this report, Area 1 ranks all other Areas of the State with respect to the adequacy of its present aeronautical development. It leads the State as a whole by 44% in per capita aircraft ownership, and by 34% in the ratio of aircraft to airport units. At the same time, the coverage of its area by airports is 116% above the State average, with one civil airport for each 177 square miles of County area. While its airport facilities represent a capacity equal to the anticipated 1955 aircraft ownership, the distribution of these facilities is such as to warrant the consideration given in the following recommendations, to the end that airports will be developed of sufficient capacity and in sufficient numbers to complete the pattern and provide for the anticipated needs of each locality. Certain of the recommendations made have been based upon the requirements of Federal and State Forest Services, in conjunction with the need for airports in recreational areas; other recommendations anticipate the early establishment of feeder line routes to serve several smaller communities in San Diego County.

Jacumba

This is a Class 1, Navy developed airport approximately 60 miles southeast of San Diego, pending war surplus disposal at the present time. Recommendation is made in the San Diego Master Airport Plan that the site be acquired by the County of San Diego if declared surplus. Development of this field to full standard Class 1 is included in the 1947 National Airport Plan. The United States Forest Service requests a Class 2

facility at this location to serve its needs. The location is in the center of a natural hot springs area and adequate airport facilities would contribute to popularizing this attraction. The airport is adjacent to the natural line of flight between San Diego and Imperial Valley points, in an area without any emergency landing facilities. It is therefore recommended that consideration be given to the development of a Class 2 airport here by 1950.

Borego

The County Board of Supervisors has approved a subdivision development to be started as soon as building permits can be obtained from Federal authorities. It is anticipated that a large part of Borego Valley will be developed as a desert resort area sometime within the next five years. Extensive agricultural projects are already under way, and a Class 3 or 4 airport is given consideration in the San Diego County Master Airport Plan, during the next five-year period, to care for potential passenger and freight traffic for the section. It is understood that Borego Valley land owners have agreed to donate sufficient land to permit the installation of a Class 1 landing strip within the next few months, to be oriented along one of the proposed major runways for the future large airport. This is a flat valley area extending from the foot of the San Ysidro Mountains on the west, to the Salton Sea area on the east, and from Coyote Mountain on the north, to Grapevine Mountain and Borego Mountain on the south. It is approximately 500 feet above sea level. A natural lake lies underneath this area and water is available for the development of

the proposed resort area. Development of a Class 2 facility at a site two miles north of Borego is included in the 1947 National Airport Plan and Program.

Although the present population is small, and the main justification for an airport now would be to serve itinerant aircraft, the definite possibilities of rapid increase in population due to the subdivision and resort development contemplated, and consequent probability of air freight potential of agricultural perishables, indicate clearly the advisability of planning a Class 2 airport in this vicinity by 1950, with provision for expansion to Class 3 in 1955.

San Diego (Lindbergh Field)

No extensive additional airport development is considered necessary here during the life of this program. This report is not concerned with the need for administration buildings or hangars which it is understood are planned for future construction at this location.

San Diego (Gibbs)

Recognizing the need in the near future for the segregation of scheduled and non-scheduled traffic, and also to provide for a future potential of non-scheduled aircraft over and above the capacity of Lindbergh Field, the City of San Diego now proposes to establish a Class 2 airport at the Gibbs Field site on Kearney Mesa, although final developments depend upon the disposition by the Navy of its Miramar Camp Kearney Field. If the latter is declared surplus, it would obviate the necessity for further development of the Gibbs Field site by the City. However, the City is proceeding with the acquisition of land at this location, and development of the present Private S-2 airport to a Municipal standard Class 2 appears to be necessary by 1950. This site would serve non-scheduled aviation in the northern sector of San Diego, in which direction all recent expansion has taken place.

Santee (Gillespie)

This is a Class 4 facility recently leased to the County of San Diego by the U. S. Navy on a revocable permit. It is located close to the metropolitan center of San Diego. The site is considered, in the San Diego Master Airport Plan, to be a logical development as San Diego's second major airport. The facility would serve the eastern sector of the metropolitan area of San Diego. The airport is operable with its present equipment and capable of adequately serving feederline and air freight activities as well as two or three hundred non-scheduled aircraft.

National City

This community now has two private Commercial Class 1 airports which are probably adequate to supply

the need of non-scheduled aviation in the locality to the year 1950. The population in this service area is 20,000. Estimates for 1955 indicate that National City will have 354 aircraft, which is obviously beyond the capacity of the present airports; however, the County of San Diego has acquired, by lease, the Navy installation known as Otay-Brown Field, a Class 5 airport approximately eight miles southeast of National City, and this airport, together with the private facilities at Wolfe's Air Park and Borderland Airport at San Ysidro should amply provide for the overflow from National City until the year 1955. No additional construction is recommended in the area immediately south of San Diego in view of the potentialities of Brown Field.

La Mesa (Sweetwater NOLF)

It is understood that this location may be returned to the property owner by the Navy with the stipulation that it be maintained as an airport. For the purposes of this report, it is assumed that this flight strip will be available for utilization by civil aviation, and in this connection it would provide adequate coverage for southeastern San Diego and environs, and also for the anticipated overflow of private aircraft from National City. While this report does not anticipate a discontinuance of any of the private airports now in existence, experience has shown that their permanence cannot be guaranteed, and since the area east of San Diego is so largely dependent upon private airports, the establishment of a permanent Class 2 facility at Sweetwater should be encouraged. For the purpose of providing adequately for the anticipated 943 aircraft in 1950 and 2,203 in 1955 in San Diego proper, this facility is deemed necessary.

Del Mar

There is presently located a Class 1 county-owned airport approximately one mile north-northeast of this community. Del Mar is a famous beach resort and urban residential center. There is extensive summer activity here due to the San Diego County Fair and the Del Mar Turf Club Racing Season, the latter attracting thousands of horse-racing enthusiasts each year. While the projected private plane ownership for Del Mar would not justify any extensive development during the period under study, the air transportation needs of the thousands of visitors to the locality warrant the recommendation for the Class 3 facility which is being made in this report. Adequate airport facilities here could also handle air shipments of flowers from the neighboring Encinitas section, where flower growers already enjoy a nation-wide market. The largest poinsettia farm in the world is located at Encinitas, approximately seven miles distant from Del Mar. The 1947 National Airport Plan and Program contemplates im-

proving present facilities to Class 2 standards; however, the fact that feeder line service is proposed for Del Mar in the near future would require a Class 3 installation here.

Escondido-San Marcos

This area is now served by three privately owned Class 1 airports. According to the San Diego Master Airport Plan, Escondido airport has already achieved the 1955 potential private plane ownership for the entire township. The 1947 National Airport Plan contemplates improvement of the Escondido Class 1 to standard Class 2 facility. The U. S. Forest Service has also recommended a Class 2 airport for this location. Extensive agricultural production in the section should furnish important air freight potential of fruits and vegetables. For these reasons, a Class 2 development is recommended for this community by 1950. In recommending the Class 2 facility, it is the purpose of this report to suggest the development of any one of the present sites, dependent upon local considerations and relative costs. It is believed that provision should be made for the expansion of this recommended Class 2 to a Class 3 by 1955.

Oceanside

At present there are two privately owned airports in Oceanside, a Class 1 and a Class Sub-2. The San Diego County Master Airport Plan recommends the development of a Class 2 facility for this community. Oceanside has been designated as a stop on proposed feeder line routes and the air freight potential produced by local agricultural specialties is important. Recommendation is made therefore for a Class 3 airport by 1950, since this is the minimum requirement for routine feeder line operation.

Fallbrook

Fallbrook is approximately fifteen air miles northeast of Oceanside. Two substandard Class 1 airports serve the airport needs of the community. The San Diego County Master Airport Plan recommends installation of a standard Class 1 within the next five years inasmuch as the local population is expanding rapidly. This study concurs in this recommendation.

Forest Service

In order to provide adequate airport facilities for the Federal and State Forestry Services in their patrolling and fire-fighting activities in the Area, the following recommendations for airport installations are made:

Potrero, Class 1 by 1955; **Descanso**, Class 1 by 1950; **Capitan Grande Indian Reservation** vicinity, Class 1 by 1955; **Poway**, Class 1 by 1950; **Julian-Earthquake Valley**, Class 2 by 1950; **Coyote Creek**, Class 1 by 1950; **Pauma Indian Reservation** locality, Class 1 by 1955; **Rainbow** locality, Class 1 by 1955; **Temecula Creek** vicinity, Class 1 by 1955.

In addition to the foregoing recommendations made for forest protection alone, other airports are recommended to meet the requests of the Forest Services, both Federal and State, and to satisfy non-scheduled and recreational airport requirements:

Morena Lake

A Class 2 airport is proposed here by 1950, to be located on the south shore of the Lake. This region is developing into a popular recreational center. The proposed installation would serve as the southernmost Forest Service airport in the County, and would lie on the direct airway route between El Centro and San Diego.

Alpine

A Class 1 airport is proposed at this location for 1950. There has long been need for additional airports on the red Civil Airway #9, connecting San Diego and Imperial Valley points. This need, as well as the requirements of the U. S. Forest Service would be served by the proposed facility at Alpine.

Cuyamaca

A Class 2 airport is proposed by 1950 for Cuyamaca, which is situated in the Cuyamaca State Park. This mountain park is open the year round and has more visitors than any other mountain area in San Diego County. It is the site of the historic Stonewall Mine and now the center of a large resort area. The County Boy and Girl Scout Camps, as well as many other public camps are located within the park. This park is located within the Cleveland National Forest and the proposed airport in this locality would furnish facilities for air transportation requested by the United States Forest Service.

Palomar Mountain

A Class 2 Airport is suggested for the Palomar locality by 1950. The section is under extensive development as an all year round recreational center and is the site of the famous Palomar Observatory. This airport would be located at an altitude of 4,100 feet. The installation is also needed by the U. S. Forest Service since it would be a strategic location from which to patrol the Cleveland National Forest.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 1

AE—Airline, Existing
 AP—Airline, Projected
 FE—Feederline, Existing
 FP—Feederline, Projected

C—Cargo, Projected
 R—Recreational
 FS—Forest Services
 NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
San Diego County							
Jacumba	Jacumba NOLF	War Surplus	1	2	NS,FS,R		
Borego				(New) 2	NS,R	3	NS,R,C,FP
San Diego	Gibbs	Private	S-2	(Mun.) 2	NS		
Del Mar	Del Mar Airport	Public	1	2	R,NS	3	R,NS,C,FP
Escondido		Private	(1)	2	FS,NS	3	FS,NS,C
Oceanside		Private	1	2	NS,C,FP	3	NS,C,FP
Fallbrook		Private	(S-1)	1	NS		
Potrero						1	FS
Descanso				1	FS		
Capitan Grande Indian Reservation						1	FS
Poway				1	FS		
Julian	Earthquake Valley			2	FS		
Coyote Creek				1	FS		
Pauma Indian Reservation						1	FS
Rainbow						1	FS
Temecula Creek						1	FS
Morena Lake				2	FS,R		
Alpine				1	FS,NS		
Cuyamaca				2	FS,R		
Palomar Mountain				2	FS,NS,R		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

APPENDIX 2

AREA 2—LOS ANGELES METROPOLITAN

NATURAL CHARACTERISTICS

Area 2 includes all of Los Angeles and Orange Counties, the southwest corner of San Bernardino County lying south of Cajon Pass and west of the 117th meridian but including all of the Lake Arrowhead-Big Bear Lake mountain resort region, and western Riverside County from a point midway between Beaumont and Banning, including the communities of San Jacinto, Hemet and Sage.

Geography and Topography

The Los Angeles Metropolitan Area is situated in the south coastal region of the State with Ventura County and the Pacific Ocean on the west, Kern and San Bernardino Counties on the north, Riverside County on the east and San Diego County on the south. The Area is bounded on three sides by mountains and on the fourth by the Pacific Ocean thus forming a well defined urban area separate from the Mojave Desert. In the San Gabriel Mountains, rising from the coastal plain and less than 40 miles from the sea, are nine peaks over 8,000 feet in height. Loftiest of these are Mount San Antonio (Old Baldy), 10,080 feet, and Mount Baden-Powell, 9,389 feet, whose crests are sometimes snowcapped. Nearer the ocean, the San Gabriel Mountains rise more than 7,000 feet and are gashed by numerous canyons down which streams tumble seaward during the spring.

West of the San Gabriel Mountains are two small ranges, the Santa Susana and the Santa Monica, and between them lies the San Fernando Valley. Top elevations are below 4,000 feet and the enclosed San Fernando Valley is wide and fertile. The embayed southern slopes of the Santa Monica Mountains mark the northern shore line of Santa Monica Bay. Immediately east of the 117th meridian in Riverside County lie the San Jacinto Mountains with the peak of the same name reaching to 10,805 feet. To the south and forming the southern boundary of Area 2 extends the Piedmont section of the Santa Ana range. Elevations here are also less than on the eastern border, the high point

being in Cleveland National Forest where Santiago Park reaches an elevation of 5,569 feet.

Within the described arc of mountains lies a broad, gentle-sloping, and fertile coastal plain. Here in some 50 incorporated cities is concentrated one of the largest, wealthiest, and most diversified populations to be found in any comparable area in the world.

Land Usage

An examination of the land usage of Area 2 fails to point out the tremendous importance of agriculture in this Area's economy. Only 5 percent of California's land in farms produced 18 percent of farm income for the State in 1945. The 4,577,920 acres are at present used as follows—(From Table 15) :

Land used for crops--	638,940 acres
Idle cropland and arable pasture -----	254,260 acres
Farm woodland -----	745,275 acres
Forest and all other--	1,531,858 acres
<hr/>	
Total privately owned land-----	3,170,333 acres
National Parks and Forests -----	916,626 acres
Other public lands-----	490,961 acres
<hr/>	
Total public lands-----	1,407,587 acres

Climate

The climate of Area 2 has been described as Mediterranean—a cool climate with a warm sun. The temperature seldom rises above 85° and rarely falls below 40°; the annual mean is 62.4°. In the coastal plain region summers are rainless and the winters are mild, with an average yearly rainfall of 15 inches in the months of December through April. Farther inland higher summer temperatures and somewhat lower winter temperatures are encountered, notably at Riverside and San Bernardino. Here the July range is from 57 to 96 degrees and the January temperatures vary from 37 to 67 degrees.

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

A study of the industries and population of Area 2 shows a phenomenal growth that transportation and marketing facilities have failed to equal. In view of the national and international importance of the region,

its favorable climate, topography and the progressive attitude of its population, future transportation needs undoubtedly will be met largely by increased employment of aviation.

Mineral Production

Mineral products are the principal natural resource of Area 2. In 1945 they were evaluated at \$153,822,603 or more than 32 percent of the State total. Eighty percent of this production was in petroleum and natural gas. Next in importance were cement and other building materials. Such minerals as copper, gold, lead, granite, manganese ore, are present but have not been mined in any great quantity to date. The following table of dollar values indicates the relative production of each county or portion thereof:

VALUE OF MINERAL PRODUCTION IN AREA 2

	Mineral Production	Pct. of Calif.	Pct. of U. S.	Percent Change from Preceding Period
1930				
Los Angeles.....	\$171,616,329	46.94	3.60	-----
Orange.....	26,335,290	7.20	.55	-----
West Riverside.....	*2,415,477	.66	.05	-----
S.W. San Bernardino.....	*5,327,000	1.46	.11	-----
Total.....	\$205,694,096	56.26	4.31	-----
1935				
Los Angeles.....	\$72,148,990	27.39	1.98	-57.96
Orange.....	24,360,634	9.25	.67	-7.50
West Riverside.....	*1,669,967	.63	.04	-30.86
S.W. San Bernardino.....	*4,943,200	1.88	.14	-7.20
Total.....	\$103,122,791	39.15	2.83	-49.87
1940				
Los Angeles.....	\$98,183,754	28.64	1.76	36.08
Orange.....	17,575,147	5.12	.31	-27.85
West Riverside.....	*2,939,060	.86	.05	76.00
S.W. San Bernardino.....	*7,886,371	2.30	.14	59.54
Total.....	\$126,584,332	36.92	2.26	22.75
1945				
Los Angeles.....	\$103,641,827	21.88	-----	5.56
Orange.....	35,178,471	7.43	-----	100.16
West Riverside.....	*3,483,305	.74	-----	18.52
S.W. San Bernardino.....	*11,519,000	2.43	-----	46.06
Total.....	\$153,822,603	32.48	-----	21.52

* Estimated apportionment of county total.
(For sources, see Table 22.)

Fisheries

The fishing industry contributes approximately \$10,000,000 annually to the Area's income. In 1943, 34 percent of the State's catch was taken off this region of the California Coast. The principal varieties caught were sardines, Pacific mackerel, horse mackerel, blue-fin tuna and albacore. Use of air freight will permit shipping part of the catch to other states.

Agriculture

The great diversity and volume of agricultural produce in this Area are well illustrated by the number of carloads shipped in 1945:

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Los Angeles	Orange	Western Riverside	South-western San Bernardino
Apples.....	16	-----	2	-----
Apricots.....	5	-----	3	-----
Asparagus.....	10	-----	-----	-----
Broccoli.....	2	-----	-----	-----
Cabbage.....	509	171	-----	-----
Cantaloupes.....	73	-----	-----	-----
Carrots.....	225	-----	-----	-----
Cauliflower.....	901	28	-----	-----
Celery.....	2,208	-----	-----	6
Corn (Green).....	3	-----	-----	-----
Cucumbers.....	8	-----	-----	-----
Grapefruit.....	605	25	611	1,225
Grapes.....	53	-----	43	316
Honeydew Melons.....	3	-----	-----	-----
Lemons.....	4,364	1,192	1,011	1,714
Lettuce and Romaine.....	327	5	-----	45
Mixed Citrus Fruit.....	835	202	368	474
Mixed Deciduous Fruit.....	13	-----	-----	-----
Mixed Vegetables.....	1,625	2	-----	-----
Onions.....	128	7	77	12
Oranges and Satsumas.....	14,630	20,180	5,886	11,405
Peaches.....	31	-----	9	-----
Pears.....	5	-----	-----	-----
Peppers.....	3	-----	-----	-----
Plums and Fresh Prunes.....	4	-----	6	-----
Potatoes (White or Irish).....	270	37	1,436	572
Prunes (Dried).....	-----	-----	27	-----
Spinach.....	3	-----	15	-----
Tomatoes.....	250	-----	-----	-----
Turnips and Rutabagas.....	8	-----	-----	-----
Watermelons.....	4	-----	-----	-----
Total.....	27,121	21,849	9,494	15,769
	-----	-----	-----	74,233

Source: *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

In point of agricultural production, Area 2 ranks first in the entire United States. This is largely attributable to Los Angeles County which probably leads all other counties of the Nation in the value of farms, farm products and average value per acre of farm land. In 1945, Los Angeles topped the second greatest agricultural producing County of Tulare by 31 percent. The diversity of crops and livestock raised results in a constant harvesting and shipping season. Listed below according to monetary value are the five leading agricultural products by county, from Table 24:

	1st	2nd	3rd	4th	5th
Los Angeles.....	Dairy	Oranges	Poultry	Nursery	Lemons
Orange.....	Oranges	Dairy	Lemons	Beans	Beef
Western Riverside.....	Oranges	Beef	Lemons	Eggs-Turkeys	Dairy
Southwest San Bernardino.....	Oranges	Lemons	Dairy	Poultry	Grapes

Source: California State Chamber of Commerce.

The following table shows that cash farm income in Area 2 increased more rapidly from 1940 to 1945 than it did in the Nation and equalled the State increase:

GROSS CASH FARM INCOME—1940 AND 1945
(From Table 40)
(In thousands of dollars)

	1940			1945			
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	Percent change 1940 to 1945
United States.....	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California.....	\$672,926	100.00	8.06	\$1,786,497	100.00	8.60	165.48
Los Angeles.....	67,000	9.96	.80	175,820	9.84	.85	162.41
Orange.....	21,500	3.19	.26	63,385	3.55	.30	194.81
West Riverside*	14,250	2.12	.17	35,267	1.98	.17	147.48
S.W. San Bernardino*	21,120	3.14	.25	53,973	3.02	.26	155.56
Total Area 2.....	\$123,870	18.41	1.48	\$328,445	18.39	1.58	165.15

* Estimated apportionment of county totals.

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States*, 1946.

Manufacturing

Since World War I the Los Angeles Metropolitan Area has been one of the Nation's most rapidly growing industrial centers and by 1939 it ranked seventh in value of production among the 33 industrial areas in the country. In that year \$512,526,749 was added to the value of raw materials to bring the total value of manufactured products to \$1,219,433,652, more than 43 percent of the State total.

With the advent of World War II, tremendous expansion increased average insured employment from 175,727 in 1939 to 621,522 in 1943 and raised the total insured payroll from \$272,184,460 to \$1,673,676,410. At the present time value added to raw materials by manufacture is estimated at more than \$1,600,000,000 in Los Angeles County alone.

Clothing manufacturers hold a prominent position in this industrial development. It is estimated that in 1946 the Los Angeles Area alone manufactured garments, notably sportswear, valued at \$300,000,000 or about 70 percent of the State total. Following the lead of Eastern manufacturers, the California stylists have begun using air freight and regular shipments are made to the East by airplane.

The motion picture industry is a unique factor in the industrial economy of Area 2. Producing 87 percent of the total films made in the United States in 1939,

motion picture companies expended \$215,664,929 that year on production. Wages and salaries alone totaled \$130,960,561. Air express has been utilized for rapid transportation of film and offers an enormous future potential.

The following tabulation shows that industrial expansion in the Area was not dependent on wartime contracts. On the contrary, in Los Angeles County the return of peace brought about the development of many new plants and the long awaited expansion of others.

RECENT MANUFACTURING DEVELOPMENT

Los Angeles County

	1945	9 Months of 1946	Total 21 Months
Number of New Plants..	226	206	432
Number of Expansions..	329	290	619
Total Plants and Expansions.....	555	496	1,051
Capital Invested—New Plants.....	\$34,742,000	\$56,673,000	\$91,415,000
Capital Invested—Expansions.....	48,905,000	57,736,000	106,641,000
Total Capital Invested.....	\$83,647,000	\$114,409,000	\$198,056,000

Source: Los Angeles Chamber of Commerce.

During the recent war, Area 2 became the aircraft manufacturing center of the world; manufacturing expansion was further accelerated by addition of metal working, synthetic rubber, automobile manufacture and other basic industries. The majority of the new plants included above are engaged in food processing.

Tourist and Travel Industry

Area 2 contains three National Forests—Angeles, San Bernardino and Cleveland—and ten State parks. The phenomenal number of visitors to each are listed below:

VISITORS TO CALIFORNIA STATE PARKS IN AREA 2, 1946
(From Table 18)

	Number of Visitors	
Los Angeles		
Alamitos Beach.....	150,000	
Lummis Home "El Alisal".....	2,000	
Manhattan Beach.....	208,000	
Pio Pico Mansion.....	2,271	
Santa Monica Beach.....	7,300,000	
Will Rogers Beach.....	9,480,000	
Will Rogers Park.....	81,950	
		17,224,221
Orange		
Doheny Beach.....	180,400	
Huntington Beach.....	35,000	
San Clemente Beach.....	52,345	
		267,745
Total.....		17,491,966

Source: California Department of Natural Resources, Division of Beaches and Parks.

Other recreational facilities combine with the numerous parks, forests and beaches to make this Area pre-eminent among playgrounds throughout the world. It is an exotic land of lofty purple mountains and azure ocean, with a climate adapted to every sport from surfing to skijoring. The following information prepared by the All Year Club of Southern California indicates that out-of-State summer visitors to the many beautiful beaches and especially to the delightful mountain resorts outnumber winter visitors of the same category. This survey covered the volume and value of tourist travel in Southern California but it may be assumed that most of these tourists visited the Los Angeles Area.

Time of Survey	Number of Out-of-State Tourists	Revenue
Winter—1941.....	722,364	\$106,909,872
Summer—1941.....	1,147,250	95,279,880
	1,869,614	\$202,189,752

Forest Service

Angeles, Cleveland, and San Bernardino National Forests are included in the Area. Adequate airport facilities are needed by visitors and by the forestry services. The requirements of the Federal and State forestry services are listed below:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY AND OF THE UNITED STATES FOREST SERVICE

Area 2 by Counties

Los Angeles County

1. Class 2 at San Fernando—United States Forest Service
2. Class 2 at Pasadena—United States Forest Service
3. Class 2 at Alpine (Mint Canyon)—United States Forest Service
4. Class 2 at Gorman (Quail Field)—United States Forest Service

The United States Forest Service will use Palm-dale and Los Angeles (Mines) Fields in their present condition.

Orange County

The State Division of Forestry will use the following airports in their present condition.

- | | |
|---------------|-------------------------|
| 1. Irvine | 6. Buena Park |
| 2. Tustin | 7. Los Alamitos |
| 3. Costa Mesa | 8. Gloryetta |
| 4. Cypress | 9. Huntington Beach |
| 5. La Habra | 10. San Juan Capistrano |

Riverside County

1. Class 1 at Perris—State Division of Forestry
2. Class 2 at Elsinore—United States Forest Service

The State Division of Forestry will use Norco, Elsinore and Hemet Fields in their present condition.

San Bernardino County

1. Class 2 at Big Bear—United States Forest Service

The United States Forest Service will use San Bernardino and Ontario Airports in their existing condition.

Distribution and Transportation

In June 1946 Area 2 was served by three trans-continental railroads, Atchison, Topeka, and the Santa Fe, the Southern Pacific and the Union Pacific; one inter-urban railway, the Pacific Electric; five transecontinental bus lines; and major intra-State bus and truck lines.

The Los Angeles-Long Beach Harbor with a 25 mile frontage provides excellent port facilities and handles annually goods valued at approximately \$1,000,000,000. In 1940 Los Angeles ranked first on the Pacific Coast and fourth in the Nation in the value of foreign trade. In that year exports totaled \$125,399,000 and consisted

principally of crude and refined petroleum products. Imports represented a value of \$93,908,000, and included such items as bananas, copra, crude rubber, lumber, sugar and coffee. In 1946 imports and exports amounted to 6,347,200,000 pounds valued at \$164,000,000.

To illustrate further the enormous amount of land, water and air traffic generated in this region representative statistics follow:

POSTAL DATA

<i>Year</i>	<i>Postal Receipts</i>	<i>Pounds of Outgoing Air Mail</i>
1930 -----	\$10,996,263	533,437
1935 -----	10,251,156	907,732
1940 -----	14,090,889	2,121,747
1945 -----	22,610,909	9,680,192

In 1942 Los Angeles ranked second to New York in air mail sent. United States post office figures for that year show Los Angeles originating 1,625,640,828 pound miles of domestic air mail and 57,264,076 pound miles of foreign air mail. Los Angeles ranked fifth in the Nation for all mail groups in total number of pieces handled and in revenue except air mail. The following table shows the volume and value of mail handled:

	<i>Revenue</i>	<i>Number of Pieces</i>
First Class (except air mail) -----	\$7,927,612	296,112,480
Air Mail — Domestic -----	1,612,371	21,595,577
Air Mail — Foreign -----	222,751	1,211,197

The accompanying table furnishes evidence of the importance of Los Angeles as an air express shipping and receiving center, and also points out the consistent growth in this field.

<i>Year</i>	<i>Los Angeles Shipments by Air</i>
1936 -----	64,940
1939 -----	119,262
1942 -----	195,808
1945 -----	306,654

A discussion of existing airport facilities, air passenger and air freight potential will follow in another section.

Major highways radiate in all directions from the Los Angeles Metropolitan Area, connecting many of its newer cities and subdivisions which are entirely dependent upon automotive transportation. Highway No. 101 follows the coast and crosses the western section of the Area. Highways No. 60 and 66 parallel each other in an easterly direction from Los Angeles and at San Bernardino Highway No. 66 turns north to Barstow, thence east to Needles. Highway No. 60 continues across Riverside County from Riverside to Blythe. Highway No. 395 traverses the entire eastern section of this Area in a north-south direction. Highways No. 99 and 6 from the north connect at Newhall and enter Los Angeles.

Some mass transportation is handled by street cars, buses and the Pacific Electric Railway, but most of the movement is by private automobile, particularly between outlying suburbs and cities. Reference to Table 95 will show the increasingly high per capita automobile and truck registration in this Area as applied to the State average.

Indices of Purchasing Power

The indices given in Table 95 show bank deposits increasing more rapidly in Area 2 than in the State as a whole and in 1944 they had reached over 41 percent of the State total, exceeding the State per capita. In 1945 per capita individual incomes remained slightly above the State level and in the same year per capita retail sales topped the State average by 32 percent.

Applied to aeronautics, these conclusions would guarantee a sound economic basis for financing airport improvements and developments, a vast passenger potential for airplane carriers and a wide market for private plane sales.

The industrial production of this Area provides an impressive air freight potential, not only domestic, but in the foreign trade field due to the proximity of Mexico, Central and Latin America. Add to these factors the enormous tourist airplane passenger possibilities and it seems certain that Area 2 will maintain its foremost position in the aeronautical development of California. This development will now be discussed in detail.

TABLE 95
INDICES OF PURCHASING POWER FOR AREA 2
Deposits of Individuals, Partnerships, and Corporations^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Los Angeles.....	\$1,550,477	36.42	\$2,000,365	36.34	\$2,650,695	36.87	\$3,297,772	38.01
Orange.....	43,365	1.02	68,461	1.24	99,334	1.38	128,365	1.48
Western Riverside*.....	19,776	.46	31,124	.57	46,198	.64	59,044	.68
S.W. San Bernardino*.....	30,848	.73	45,955	.84	68,205	.95	91,725	1.06
Totals.....	\$1,644,466	38.63	\$2,145,905	38.99	\$2,864,432	39.84	\$3,576,906	41.23

Per Capita Individual Incomes^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Los Angeles.....	\$2,390,816	\$858	106.85	\$5,047,118	\$1,428	103.93	66.43
Orange.....	74,206	567	70.61	174,640	1,043	75.91	83.95
Western Riverside*.....	39,107	494	61.52	95,466	948	69.00	91.90
S.W. San Bernardino*.....	77,768	549	68.37	202,606	1,029	74.89	87.43
Totals.....	\$2,581,897	\$830	103.38	\$5,519,830	\$1,380	100.44	66.27

Per Capita Assessed Valuation^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent of California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent of California Per Capita	Percent Change from Preceding Period
Los Angeles.....	\$4,514,261,968	\$2,044	113.75	-----	\$2,346,332,065	\$969	88.98	-52.59
Orange.....	206,832,045	1,743	96.99	-----	191,962,630	1,615	148.30	-7.34
Western Riverside*.....	63,506,670	1,047	58.26	-----	61,334,591	893	82.00	-14.71
S.W. San Bernardino*.....	124,623,066	1,042	57.99	-----	139,603,949	1,047	96.14	+4.48
Totals.....	\$4,909,223,749	\$1,958	108.96	-----	\$2,739,233,235	\$999	91.74	-48.98
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent of California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent of California Per Capita	Percent Change from Preceding Period
Los Angeles.....	\$2,485,965,560	\$892	86.35	- 7.95	\$2,978,392,865	\$1,230	87.61	37.89
Orange.....	192,370,150	1,471	142.40	- 8.92	235,179,840	1,979	140.95	34.53
Western Riverside*.....	65,843,003	832	80.54	- 6.83	85,591,403	1,246	88.75	49.76
S.W. San Bernardino*.....	127,219,936	897	86.83	-14.33	160,370,818	1,203	85.68	34.11
Totals.....	\$2,871,398,649	\$915	88.58	- 8.41	\$3,459,534,926	\$1,261	89.81	37.81

TABLE 95—Continued
 INDICES OF PURCHASING POWER FOR AREA 2
 Per Capita Automobile and Truck Registrations^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Los Angeles-----	842,528	.38	105.56	-----	884,515	.37	105.71	—2.63
Orange-----	49,579	.42	116.67	-----	48,295	.41	117.14	—2.38
Western Riverside*-----	22,745	.38	105.56	-----	25,342	.37	105.71	—2.63
S.W. San Bernardino*-----	42,068	.35	97.22	-----	45,609	.34	97.14	—2.86
Totals-----	956,920	.38	105.56	-----	1,003,761	.37	105.71	—2.63
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Los Angeles-----	1,160,124	.42	105.00	13.51	1,182,343	.33	106.45	—21.43
Orange-----	58,728	.45	113.00	9.76	65,548	.39	125.81	—13.33
Western Riverside*-----	31,508	.40	100.00	8.11	33,782	.34	109.68	—15.00
S.W. San Bernardino*-----	57,015	.40	100.00	17.65	62,535	.32	103.23	—20.00
Totals-----	1,307,375	.42	105.00	13.51	1,344,208	.34	109.68	—19.05

Per Capita Retail Sales^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Los Angeles-----	\$1,286,894	\$583	103.00	-----	\$939,409	\$388	101.31	—33.45
Orange-----	60,996	514	90.81	-----	38,208	321	83.81	—37.55
Western Riverside*-----	28,155	464	81.98	-----	22,461	327	85.38	—29.53
S.W. San Bernardino*-----	55,328	463	81.80	-----	41,316	310	80.94	—33.05
Totals-----	\$1,431,373	\$571	88.34	-----	\$1,041,394	\$380	99.22	—33.45
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Los Angeles-----	\$1,314,497	\$472	102.39	21.64	\$2,774,893	\$996	134.78	111.01
Orange-----	50,112	383	83.08	19.31	108,552	830	112.31	116.71
Western Riverside*-----	29,218	369	80.04	12.84	63,545	803	108.66	117.62
S.W. San Bernardino*-----	52,577	371	80.48	19.68	118,088	833	112.72	124.52
Totals-----	\$1,446,404	\$461	100.00	21.32	\$3,065,078	\$977	132.21	111.93

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.
^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.
 * Estimated apportionment of county totals.

Population

Table 96 indicates that the population of the Area since 1930 has increased at a rate equal to the growth of the State. It is estimated that by 1955 the Area's population will be double that of 1930. Table 97 shows

the population growth for the incorporated and unincorporated cities in the Area from the beginning of the century. The continued expansion of an already air-minded population will result in an increased airplane passenger and private airplane owner potential.

CALIFORNIA AIRPORTS

TABLE 96
POPULATION OF AREA 2 BY FIVE-YEAR PERIODS
1930-1955

	Population	Pct. of Calif- ornia	Increase over Preced- ing period		Population	Pct. of Calif- ornia	Increase over Preced- ing period
1930 ^a				1945 ^d			
Los Angeles.....	2,208,492	38.90	-----	Los Angeles.....	3,533,500	38.90	26.85
Orange.....	118,674	2.09	-----	Orange.....	167,500	1.84	28.10
West Riverside*.....	60,649	1.07	-----	West Riverside*.....	100,725	1.11	27.27
S.W. San Bernardino*.....	119,604	2.11	-----	S.W. San Bernardino*.....	196,856	2.17	38.85
Total Area 2.....	2,507,419	44.17	-----	Total Area 2.....	3,998,581	44.02	27.45
1935 ^b				1950 ^e			
Los Angeles.....	2,421,825	39.81	9.66	Los Angeles.....	3,921,850	39.48	10.99
Orange.....	118,845	1.96	.13	Orange.....	186,750	1.88	11.49
West Riverside*.....	68,693	1.13	13.26	West Riverside*.....	111,562	1.12	10.76
S.W. San Bernardino*.....	133,331	2.19	11.48	S.W. San Bernardino*.....	214,280	2.15	8.85
Total Area 2.....	2,742,694	45.09	9.38	Total Area 2.....	4,434,442	44.63	10.90
1940 ^c				1955 ^f			
Los Angeles.....	2,785,643	40.33	15.02	Los Angeles.....	4,444,075	39.97	13.32
Orange.....	130,760	1.89	10.02	Orange.....	211,350	1.90	13.17
West Riverside*.....	79,143	1.15	15.21	West Riverside*.....	126,375	1.14	13.28
S.W. San Bernardino*.....	141,775	2.05	6.33	S.W. San Bernardino*.....	242,550	2.18	13.19
Total Area 2.....	3,137,321	45.42	14.39	Total Area 2.....	5,024,350	45.19	13.30

* Apportionment of county totals for Riverside and San Bernardino between Areas 2 and 3.

Source: ^a and ^c United States Census—From Table 34.

^b Midpoint of California Taxpayers' Association Estimate for January 1, 1935, and January 1, 1936.

^d Midpoint of California Taxpayers' Association Estimate for January 1, 1945, and January 1, 1946—From Table 34.

^e and ^f Estimated projections of the California Reconstruction and Reemployment Commission—From Table 34.

TABLE 97
POPULATION STATISTICS OF AREA 2
Incorporated Places

Aviation Area, County City	Date Incor- porated	Decennial Census					January, 1947 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 2.....		228,274	615,057	1,100,880	2,507,419	3,137,321	†4,122,690	-----
Los Angeles County.....		170,298	504,131	936,455	2,208,492	2,785,643	†3,611,000	-----
*Alhambra.....	1903	-----	5,021	9,096	29,472	38,935	44,013	May 20, 1946
*Arcadia.....	1903	-----	696	2,239	5,216	9,122	15,524	Sept. 5, 1946
*Avalon.....	1913	-----	-----	586	1,897	1,637	-----	-----
*Azusa.....	1898	863	1,477	2,460	4,808	5,209	-----	-----
*Bell.....	1927	-----	-----	-----	7,884	11,264	13,742	May 23, 1946
*Beverly Hills.....	1914	-----	-----	674	17,429	26,823	28,217	July 6, 1945
*Burbank.....	1911	-----	-----	2,913	16,662	34,337	53,899	July 28, 1943
*Claremont.....	1907	-----	1,114	1,728	2,719	3,057	-----	-----
*Compton.....	1888	-----	922	1,478	12,516	16,198	23,460	April 21, 1944
*Covina.....	1901	-----	1,652	1,999	2,774	3,049	-----	-----
*Culver City.....	1917	-----	-----	503	5,669	8,976	12,360	May 5, 1944
*Eagle Rock City.....	-----	-----	-----	2,256	Annexed to Los Angeles	-----	-----	-----
*El Monte.....	1912	-----	-----	1,283	3,479	4,746	-----	-----
*El Segundo.....	1917	-----	-----	1,563	3,503	3,738	5,625	Mar. 6, 1944
*Gardena.....	1930	-----	-----	-----	-----	5,909	9,319	May 31, 1944
*Glendale.....	1906	-----	2,746	13,536	62,736	82,582	96,495	May 8, 1946
*Glendora.....	1911	-----	-----	2,028	2,761	2,822	-----	-----
*Hawthorne.....	1922	-----	-----	-----	6,596	8,263	10,119	Sept. 8, 1943
*Hermosa Beach.....	1907	-----	679	2,327	4,796	7,197	9,550	May 16, 1944
*Huntington Park.....	1906	-----	1,299	4,513	24,591	26,648	-----	-----

TABLE 97—Continued
POPULATION STATISTICS OF AREA 2
Incorporated Places

Aviation Area, County City	Date Incor- porated	Decennial Census					January, 1947 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
*Inglewood.....	1908	-----	1,536	3,286	19,480	30,114	37,912	Jan. 27, 1944
*La Verne.....	1906	-----	954	1,698	2,860	3,092	-----	-----
*Long Beach.....	1897	2,252	17,809	55,593	142,032	164,271	241,109	Jan. 24, 1946
*Los Angeles.....	1850	102,479	319,198	576,673	1,238,048	1,504,277	1,805,687	Jan. 28, 1946
*Lynwood.....	1921	-----	-----	-----	7,323	10,982	15,276	May 12, 1944
*Manhattan Beach.....	1912	-----	-----	859	11,891	6,398	9,290	Mar. 20, 1944
*Maywood.....	1924	-----	-----	-----	6,794	10,731	12,741	Sept. 11, 1946
*Monrovia.....	1887	1,205	3,576	5,480	10,890	12,807	-----	-----
*Montebello.....	1920	-----	-----	-----	5,498	8,016	13,144	June 28, 1945
*Monterey Park.....	1916	-----	-----	4,108	6,406	8,531	11,393	Nov. 2, 1945
Palos Verdes Estates.....	1939	-----	-----	-----	-----	987	-----	-----
*Pasadena.....	1886	9,117	30,291	45,354	76,086	81,864	98,279	April 26, 1946
*Pomona.....	1888	5,526	10,207	13,505	20,804	23,539	-----	-----
*Redondo Beach.....	1892	855	2,935	4,913	9,347	13,092	17,036	May 23, 1944
*San Fernando.....	1911	-----	-----	3,204	7,567	9,094	11,286	May 28, 1946
*San Gabriel.....	1913	-----	-----	2,640	7,224	11,867	16,840	June 14, 1946
*San Marino.....	1913	-----	-----	584	3,730	8,175	-----	-----
*Santa Monica.....	1886	3,057	7,847	15,252	37,146	53,500	67,473	July 1, 1946
*Sierra Madre.....	1907	-----	1,303	2,026	3,550	4,581	-----	-----
*Signal Hill.....	1924	-----	-----	-----	2,932	3,184	-----	-----
*South Gate.....	1923	-----	-----	-----	19,632	26,945	-----	-----
*South Pasadena.....	1888	1,001	4,649	7,652	13,730	14,356	-----	-----
*Torrance.....	1921	-----	-----	-----	7,271	9,950	-----	-----
Venice.....	-----	-----	3,119	10,385	Annexed to	Los Angeles	-----	-----
Vernon.....	1905	-----	772	1,005	1,269	850	-----	-----
Watts.....	-----	-----	1,922	4,529	Annexed to	Los Angeles	-----	-----
West Covina.....	1923	-----	-----	-----	769	1,072	-----	-----
*Whittier.....	1898	1,590	4,550	7,997	14,822	16,115	20,113	Sept. 16, 1946
*Belvedere Township.....	-----	-----	-----	-----	33,023	37,192	-----	-----
Orange County.....	-----	19,696	34,436	61,375	118,674	130,760	†171,400	-----
*Anaheim.....	1870	1,456	2,628	5,526	10,995	11,031	12,897	May 20, 1946
*Brea.....	1917	-----	-----	1,037	12,435	2,567	-----	-----
*Fullerton.....	1904	-----	1,725	4,415	10,860	10,442	12,173	April 26, 1946
*Huntington Beach.....	1909	-----	815	1,687	3,690	3,738	5,173	May 10, 1946
*Laguna Beach.....	1927	-----	-----	-----	11,981	4,460	6,524	June 7, 1945
La Habra.....	1925	-----	-----	-----	2,273	2,499	-----	-----
*Newport Beach.....	1906	-----	445	894	12,203	4,438	9,396	April 16, 1945
*Orange.....	1888	1,216	2,920	4,884	8,066	7,901	9,286	Aug. 1, 1945
Placentia.....	1926	-----	-----	-----	1,606	1,472	-----	-----
San Clemente.....	1928	-----	-----	-----	667	479	1,188	Nov. 6, 1944
*Santa Ana.....	1886	4,933	8,429	15,485	30,322	31,921	38,015	Mar. 6, 1944
Seal Beach.....	1915	-----	-----	669	1,156	1,553	2,913	May 29, 1944
Stanton.....	-----	-----	-----	695	Annexed	-----	-----	-----
Tustin.....	1927	-----	-----	-----	926	953	-----	-----
Western Riverside County.....	-----	13,423	26,022	37,723	60,649	79,143	†113,250	-----
Beaumont.....	1912	-----	-----	857	1,332	2,208	3,016	April 4, 1946
*Corona.....	1896	1,434	3,540	4,129	7,018	8,764	9,146	Oct. 22, 1945
Elsinore.....	1888	279	488	633	1,350	1,552	-----	-----
*Hemet.....	1910	-----	992	1,480	12,235	2,595	3,321	April 12, 1946
Perris.....	1911	-----	-----	499	763	1,011	1,449	April 8, 1946
*Riverside.....	1883	7,973	15,212	19,341	29,696	34,696	43,939	May 17, 1945
San Jacinto.....	1888	583	898	945	1,346	1,356	1,718	April 13, 1946
Southwestern San Bernardino County.....	-----	24,857	50,468	65,327	119,604	141,775	†227,040	-----
*Chino.....	1910	-----	1,444	2,132	3,118	4,204	-----	-----
*Colton.....	1887	1,285	3,980	4,282	8,014	9,686	12,717	June 3, 1946
*Ontario.....	1891	722	4,274	7,280	13,583	14,197	19,638	June 26, 1946
*Redlands.....	1888	4,797	10,449	9,571	14,177	14,324	16,718	May 6, 1946
Rialto.....	1911	-----	-----	961	1,642	1,770	-----	-----
*San Bernardino.....	1854	6,150	12,779	18,721	37,481	43,646	56,193	May 23, 1946
*Upland.....	1906	-----	2,384	2,912	4,713	6,316	7,814	Aug. 7, 1945

* URBAN—1940.

† Estimate of California Taxpayers' Association.

‡ Classification changed to urban in this interval.

TABLE 97—Continued
POPULATION STATISTICS OF AREA 2
Unincorporated Places

Population	Population	Population
Los Angeles County	Los Angeles County—Continued	Orange County—Continued
Agoura.....500	Puente.....1,648	Wintersburg.....709
Altadena.....23,558	Rivera.....968	Yorba Linda.....1,141
Artesia.....5,837	Rosemead.....6,680	
Bairdstown.....11,000	San Dimas.....1,864	Western Riverside County
Baldwin Park.....7,572	Santa Fe Springs.....2,000	Alberville.....550
Bellflower.....11,425	Saugus.....175	Box Springs.....125
Bell Gardens.....6,879	Simons.....822	Calimesa.....175
Belvedere Gardens.....33,502	Spadra.....1,900	Casa Blanca.....400
Calabasas.....150	Sunny Slope.....800	Highgrove.....650
Central Gardens.....400	Temple City.....5,196	Lakeview.....200
City Terrace.....626	Topanga.....600	La Sierra Heights.....1,777
Clearwater.....7,000	Verdugo City.....1,273	Mira Loma.....865
Cudahy.....4,761	View Heights.....601	Morena.....150
Davidson City.....1,180	View Park.....2,080	Murrieta.....150
Dominguez.....5,000	Walnut.....275	Norco.....1,609
Downey.....9,364	Walnut Park.....9,282	Nuevo.....450
Duarte.....1,971	West Hollywood.....20,078	Prado.....325
East Los Angeles.....41,507	West Whittier.....500	Riverside Home Gardens.....641
East Whittier.....879	Willowbrook.....5,731	Romoland.....350
Flintridge.....1,070	Wilmar.....11,590	Sage.....125
Florence.....23,000		Sunnymead.....125
Garvey.....6,000	Orange County	Temecula.....250
Girard.....600	Atwood.....250	Winchester.....250
Graham.....9,000	Balboa.....850	Woodcrest.....175
Harbor City.....4,700	Balboa Island.....1,100	
Hawthorne.....8,300	Buena Park.....2,491	Southwestern San Bernardino
Hynes.....2,965	Corona del Mar.....400	County
Irwindale.....614	Costa Mesa.....3,579	Alta Loma.....3,927
La Canada.....2,334	Cypress.....797	Big Bear City.....813
La Crescenta.....3,623	Dana Point.....200	Bloomington.....2,726
Lakewood Village.....1,800	Doheny Park.....575	Bryn Mawr.....225
Lamanda.....8,876	El Modena.....575	Camp Baldy.....125
La Mirada.....350	El Toro.....125	Crestline.....400
Lancaster.....2,118	Garden Grove.....2,423	Cucamonga.....3,000
Las Flores.....125	Gloryetta.....750	Del Rosa.....646
Lawndale.....4,019	Greenville.....125	Devore.....150
Lennox.....10,526	Harding.....350	East Highland.....654
Littlerock.....325	Irvine.....150	Etiwanda.....498
Llano.....125	Los Alamitos.....937	Fontana.....4,523
Lomita.....5,639	Midway City.....841	Guasti.....600
Los Nietos.....1,837	Olinda.....475	Harlem.....300
Malibu Beach.....900	Olive.....675	Highland.....2,411
Mar Vista.....1,600	San Juan Capistrano.....724	Lake Arrowhead.....400
Montebello Gardens.....1,241	Silverado.....225	Loma Linda.....1,589
Montrose.....2,710	Stanton.....926	Mentone.....600
Nienach.....150	Sunset Beach.....200	Monte Vista.....375
Newhall.....1,666	Talbert.....225	Patton.....4,200
Norwalk.....3,749	Three Arches.....350	Summit.....150
Palmdale.....913	Thurin.....325	Twin Peaks.....450
Pico.....2,594	Vista Park.....150	Wrightwood.....300
Pico Park.....1,034	Westminster.....1,792	Yucaipa.....500

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

The terrain of Area 2 is predominantly composed of a relatively smooth coastal plain, that lends itself exceedingly well to the construction of airports. In leaving this area by airplane, flight over mountains is generally necessary, but natural passes and numerous adjacent flat areas minimize the barrier effect of the several mountain ranges. Coastwise routes from Santa

Barbara, San Diego and Santa Catalina Island to Los Angeles follow the sea level and thereby do not encounter these natural obstacles of flight.

Existing airports in this area include large military fields, extensive factory testing facilities, major and minor terminal airports, and many smaller private plane installations, all of which are listed below:

EXISTING AIRPORTS—AREA 2

Plate M-2 Map Code	City and Airport Name	Ownership	Class
LOS ANGELES COUNTY			
2-1	Newhall—CAA Site 3A	U. S.-CAA	S-3
2-2	San Clemente Is.—NAAS	U. S. Navy	4
2-3	San Clemente Is.—NOLF	U. S. Navy	
2-4	San Pedro—NAS	U. S. Navy	4
2-5	Lancaster—Victory	U. S.-WAA	2
2-25	Hawthorne—Municipal	City of Hawthorne	4
2-26	Lancaster—War Eagle	County of Los Angeles	2
2-27	Llano—Grey Butte	County of Los Angeles	2
2-28	Long Beach—Daugherty	City of Long Beach	6
2-29	Los Angeles—Mines	City of Los Angeles	4
2-30	Palmdale—(AAFld.)	Palmdale Irrig. Dist.	6
2-31	Rosamond—Liberty	County of Los Angeles	2
2-32	Santa Monica—Clover	City of Santa Monica	4
2-33	Torrance—Lomita Flight Strip	City of Torrance	4
2-50	Artesia—Cranford	Commercial-Private	S-2
2-51	Avalon—Buffalo Springs	Commercial-Private	2
2-52	Bellflower	Commercial-Private	1
2-53	Burbank—Lockheed	Commercial-Private	5
2-54	Canoga Park—Reese	Private	S-1
2-55	Castaic—Forst	Private	S-2
2-56	Compton—Central	Commercial-Private	2
2-57	Compton	Commercial-School Board	S-2
2-58	Culver City	Commercial-Private	S-2
2-59	Culver City—Hughes	Private	7
2-60	Downey—Vultee	Private	3
2-61	El Monte	Commercial-Private	1
2-62	El Monte—Rosemead	Commercial-Private	2
2-63	Gardena Valley—Western Ave.	Commercial-Private	1
2-64	Glendale—Grand Central	Commercial-Private	3
2-65	Lancaster	Commercial-Private	1
2-66	Lancaster—Antelope Valley	Commercial-Private	1
2-67	Lancaster—Quartz Hill	Commercial-Private	1
2-68	Lancaster—Sterk's Ranch	Private	S-2
2-69	Monrovia	Commercial-Private	S-2
2-70	Montebello	Commercial-Private	2
2-71	Montebello—Vail	Commercial-Private	2
2-72	Northridge—Neggins	Commercial-Private	1
2-73	Norwalk—Delpert	Commercial-Private	1
2-74	Palmdale—Galbraith	Commercial-Private	S-1
2-75	Pomona	Commercial-Private	1
2-76	Pomona—Bracket	Commercial-Private	1
2-77	Puente—Sky Ranch	Commercial-Private	S-2
2-78	San Fernando—Weightman	Commercial-Private	S-2
2-79	San Fernando—Whiteman	Commercial-Private	2
2-80	Saugus—Schmidt Bros.	Commercial-Private	1
2-81	Torrance—Community	Commercial-Private	1
2-82	Van Nuys—Metropolitan	Commercial-Private	5
2-83	Wilmington—Harbor	Commercial-Private	S-1
ORANGE COUNTY			
2-6	El Toro—MCAB	U. S. Navy	6
2-7	Los Alamitos—NAAS	U. S. Navy	5
2-8	Haster Farm—NOLF	U. S. Navy	S-1
2-9	Mile Square—NOLF	U. S. Navy	2
2-10	Palisades—NOLF	U. S. Navy	1
2-11	Santa Ana—NAS-LTA	U. S. Navy	1
2-36	Fullerton—Municipal	City of Fullerton	1
2-37	Huntington Beach—Municipal	City of Huntington Beach	1
2-38	Santa Ana—Orange County	County of Orange	4
2-101	Anaheim	Private	1
2-102	Anaheim—Post Bros.	Private	1
2-103	Buena Park—Knotts	Commercial-Private	1
2-104	Costa Mesa-Newport—Sky Harbor	Commercial-Private	S-2
2-105	Cypress	Commercial-Private	1
2-106	La Habra—Imperial Ranch	Private	2
2-107	San Juan Capistrano	Commercial-Private	S-1
2-108	Sunset Beach	Commercial-Private	S-1

EXISTING AIRPORTS—AREA 2—Continued

Plate M-2 Map Code	City and Airport Name	Ownership	Class
RIVERSIDE COUNTY (Western)			
2-15	Riverside—March AA Base	U. S. Army	6
2-16	Hemet—Ryan D.P.C.	U. S.-WAA	1
2-17	Hemet—Ryan Aux. No. 1	U. S.-WAA	1
2-120	Calimesa	Commercial-Private	-
2-121	Corona	Commercial-Private	1
2-122	Elsinore—Elsinore	Commercial-Private	S-2
2-123	Elsinore—Lake Elsinore	Commercial-Private	S-1
2-124	Glen Ivy	Private	-
2-125	Hemet—Ramona	Private	1
2-126	Norco	Commercial-Private	S-1
2-127	Riverside—Arlington	Commercial-Private	S-2
2-128	Riverside—W. Riverside	Commercial-Private	2
2-129	San Jacinto—Harmon	Commercial-Private	1
SAN BERNARDINO COUNTY (Southwestern)			
2-20	San Bernardino Army Air Depot	U. S. Army	6
2-21	Chino—Cal Aero (DPC)	U. S.-WAA	4
2-45	Fontana—(Cal. Aero. Aux.)	County of San Bernardino	1
2-46	Ontario International (AA Fld.)	City of Ontario	5
2-140	Big Bear City	Commercial-Private	S-1
2-141	Claremont—Cable	Commercial-Private	1
2-142	Fontana—Leach	Commercial-Private	1
2-143	Redlands—(Mentone)	Commercial-Private	1
2-144	Rialto—Morrow	Commercial-Private	2
2-145	San Bernardino—Warren & Day	Commercial-Private	2
2-146	San Bernardino—Tri-City	Commercial-Private	S-2

The first scheduled airline service in Los Angeles was started early in 1926 by Western Air Express, making a connection with New York to San Francisco flights at Salt Lake City, Utah. In June of 1926 Western Air Express opened a daily service line to Kansas City, connecting with train to New York, and in the same month, Transcontinental Air Transport began a daily service to New York in conjunction with two railroads.

The concentration of major segments of the national airplane manufacturing industry in Southern California resulted to a great extent from a climate that permitted all-year flying and testing, as well as great open spaces in this section of the country and a favorable labor market. Of the important results directly emanating from this industry, the high degree of air-mindedness of the populace, and local establishment of the business utility of aircraft, have resulted in Los Angeles becoming one of the aviation activity centers of the world. A further result is the obvious fact that airport master planning must give careful consideration to manufacturers' testing and service fields, to protect this industry and provide it with the fullest opportunity for expansion.

Charter plane flying has been developed to a high degree in this Area, including such phases as flights to the Del Mar Racetrack, travel between Los Angeles and Palm Springs and a major business in flying for the motion picture industry, both as "actors" and personnel transport.

There are now seven scheduled airlines operating out of Area 2, with a total of 306 daily landings and departures, engaging in both domestic and foreign commerce, with terminals divided as follows:

City	In	Out	Total	Served By
Burbank	24	24	48	A B
Long Beach	12	12	24	A B
Los Angeles	117	117	234	A B C D E F G
	153	153	306	

A—Western Air Lines.
 B—United Air Lines.
 C—Southwest Airways.
 D—Trans-World Airlines.
 E—Pacific Air Lines (N. C.).
 F—Pan American Airways.
 G—American Airlines.

The Los Angeles Metropolitan Area is a focal point of airline operations to every major population in the Western Hemisphere and Asia.

A wide use of air express is found in this section of the State, with shipments of motion picture film, commercial bank paper, wearing apparel and salesmen's samples quite commonplace, and the list of other types of shipments expanding so rapidly as to preclude an adequate summary. Foreign trade by air had an early beginning in this Area and regular shipments to South America and the Orient are assuming unforeseen proportions, all of which gives ample proof of the fact that air transport has an unusually substantial basis in this region, and its constant growth is assured.

Currently there is a critical lack of storage facilities for private aircraft in the Los Angeles Metropolitan

Area, despite the various indications of increased private airplane operation. The construction of fields has not kept pace with the normal growth of ownership, disregarding the tremendous number of war surplus planes that have been purchased by local residents. Again, the consideration of great distance between population and trading centers has been a major factor

in the development of this problem, with the situation now heavily affecting private plane sales because of lack of operational facilities.

These several points of commercial flying, charter service and private plane use, emphasize the immediate need for current and long range planning to meet the needs of this most heavily populated part of California.

ESTIMATES OF SCHEDULED AIR TRANSPORT

Projecting the commercial passenger potential of Area 2, based upon past traffic, it is obvious that airline schedules will mandate the greatest possible expansion and development of terminal type airports and complementary facilities. While the estimates only deal with on and off passengers, the through and connecting

traffic will also assume greatly increased proportions that will pose new problems in airport development.

Based upon the 1946 commercial traffic figures, it is anticipated that the Los Angeles Metropolitan Area will generate 1,850,035 on and off passengers in 1950, and 2,724,134 in 1955, divided among terminals as follows:

AREA 2—PROJECTION OF SCHEDULED AIR TRANSPORT
ON AND OFF REVENUE PASSENGERS

	1946	1950	1955
Los Angeles Airport.....	Schedules began December 1946, Included with Burbank in 1946	1,294,017	1,905,480
Percent California.....		36.59	37.10
Percent United States.....		4.04	4.76
Burbank (Lockheed).....	1,370,080	265,793	391,390
Percent California.....	52.82	7.52	7.62
Percent United States.....	5.69	.83	.98
Long Beach.....	25,453	28,915	42,578
Percent California.....	.98	.82	.83
Percent United States.....	.11	.09	.11
Subtotal—Los Angeles Metropolitan Area.....	1,395,533	1,588,725	2,339,448
Percent California (Table 68).....	53.59	44.93	45.55
Percent United States.....	5.80	4.96	5.85
Riverside—San Bernardino.....	No service estab- lished.....	165,485	243,446
Percent California.....		4.68	4.74
Percent United States.....		.52	.61
Santa Ana.....	No service estab- lished.....	95,825	141,240
Percent California.....		2.71	2.75
Percent United States.....		.30	.35
Totals—Area 2.....	1,395,533	1,850,035	2,724,134
Percent California.....	43.02	52.32	53.04
Percent United States.....	5.80	5.78	6.81

Source: Projected air transport for California—Table 68.

Converting this passenger load into flight schedules, based upon the present passenger load per flight figures for 1946, it is indicated that the Los Angeles Area will need a total of 402 daily flights in 1950 and 592 in 1955; the Riverside-San Bernardino section will require 34 daily flights in 1950 and 50 in 1955; while Santa Ana should have 20 in 1950 and 30 in 1955. (In the case of

both these latter stops, their projected flights would increase the schedules for the Los Angeles Area, and have accordingly been added to the projection for that major terminal.)

Because of the important geographical location of Los Angeles, with reference to the State of California, and because it is also an important Pacific Ocean trans-

portation center, it is estimated that terminal facilities in the Area will have an additional passenger factor from connecting and feeder line flights that will amount to 600,000 persons in 1950 and 900,000 in 1955, which will greatly affect local major airport utilization.

The Los Angeles Metropolitan Area is highly agriculturalized, with a crop production that has good air freight possibilities. The probable air shipments, based upon figures of 1945 carloading, are as follows:

County	Commodity	1945		1905		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Los Angeles-----	Apricots-----	5	75	2	1.5	8	6.0
	Asparagus-----	10	120	15	18.0	28	33.6
	Broccoli-----	2	24	0	-----	5	1.2
	Cabbage-----	509	6,108	2	122.2	7	427.6
	Cantaloupes-----	73	803	2	16.1	8	64.2
	Cauliflower-----	901	10,812	0	-----	6	648.7
	Celery-----	2,208	26,496	0	-----	7	1,854.7
	Corn, green-----	3	36	14	5.0	39	14.0
	Cucumbers-----	8	88	2	1.8	13	11.4
	Grapes-----	53	901	1	9.0	5	45.1
	Honeydew Melons-----	3	33	0	-----	2	.7
	Lettuce and Romaine-----	327	3,924	6	235.4	18	706.3
	Mixed Deciduous Fruit-----	13	182	2	3.6	8	14.6
	Mixed Vegetables-----	1,625	19,500	0	-----	6	1,170.0
	Peaches-----	31	372	7	26.0	23	85.6
	Pears-----	5	75	0	-----	2	1.5
	Peppers-----	3	36	5	1.8	14	5.0
	Plums and Fresh Prunes-----	4	60	1	.6	13	7.8
	Spinach-----	3	27	4	1.1	15	4.1
	Tomatoes-----	250	3,250	23	747.5	43	1,397.5
	Turnips and Rutabagas-----	8	152	0	-----	14	21.3
	Total-----	6,041	73,074	-----	1,190	-----	6,521
Orange-----	Cabbage-----	171	2,052	2	41.0	7	143.6
	Cauliflower-----	28	336	0	-----	6	20.2
	Lettuce and Romaine-----	5	60	6	3.6	18	10.8
	Mixed Vegetables-----	2	24	0	-----	6	1.4
	Total-----	206	2,472	-----	45	-----	176
Western Riverside-----	Apricots-----	3	45	2	.9	8	3.6
	Cantaloupes-----	435	4,785	2	95.7	8	382.8
	Cauliflower-----	104	1,248	0	-----	6	74.9
	Corn, green-----	180	2,160	14	302.4	39	842.4
	Cucumbers-----	11	121	2	2.4	13	15.7
	Egg plant-----	2	24	5	1.2	18	4.3
	Honeyball Melons-----	35	385	0	-----	2	7.7
	Honeydew Melons-----	777	8,547	0	-----	2	170.9
	Lettuce and Romaine-----	806	9,672	6	580.3	18	1,741.0
	Mixed Vegetables-----	127	1,524	0	-----	6	92.0
	Peaches-----	9	108	7	7.6	23	24.8
	Plums and Fresh Prunes-----	6	90	1	.9	13	11.7
	Spinach-----	15	135	4	5.4	15	20.3
	Total-----	2,510	28,844	-----	997	-----	3,392
Southwest San Bernardino-----	Celery-----	6	72	0	-----	7	5.0
	Grapes-----	316	5,372	1	53.7	5	268.6
	Lettuce and Romaine-----	45	540	6	32.4	18	97.2
	Total-----	867	5,984	-----	86	-----	371
Area Total-----		9,124	110,374	-----	2,318	-----	10,460

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945.*

California Crop and Livestock Reporting Service and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from: Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Mich., 1944.

Converting this possible air freight tonnage into actual plane loads, results in the following summary, (from Table 82).

Based upon an average between the operation of DC-3 and DC-4 types of carriers, Area 2 can expect 4

daily in and out freight flights in 1950 and 16 daily in 1955, to handle local production. Trucking and air freight feeder flights from adjacent sections of the State could easily generate 63 additional daily in and out flights in 1950 and 200 more in 1955.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

Area 2—Los Angeles Metropolitan

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total.....		2,318	927	6.00	204	1.00
Los Angeles.....	359	1,190	476	2.65	105	.58
Orange.....	303	45	18	.12	4	.03
Western Riverside.....	265	997	399	3.01	88	.66
S.W. San Bernardino.....	253	86	34	.27	7	.06
1955 Total.....		10,460	4,184	26.00	922	6.00
Los Angeles.....	359	6,521	2,609	14.53	574	3.20
Orange.....	303	176	70	.46	16	.11
Western Riverside.....	265	3,392	1,357	10.24	299	2.26
S.W. San Bernardino.....	253	371	148	1.17	33	.26

* Source: Days in normal growing season from *Economic Survey of California, 1946*. Research Department, California State Chamber of Commerce.

The production of flowers for marketing is an important industry in this Area. Preliminary experiments have proved that flowers can be shipped profitably to the East by air and growers will soon be taking full advantage of this opportunity to expand their markets.

Combining the potential flight of passenger and air freight service, the Los Angeles Metropolitan Area can expect up to 590 daily flight movements in 1950 and 1,104 in 1955.

These figures indicate the magnitude of the commercial aviation activity that will be concentrated in Area 2, and it is obvious that by 1955 current terminal airports will be sorely taxed to meet the demands of this industry. This is one of the phases of planning that needs immediate study to preclude the possibility of a saturation point being unexpectedly reached, with a resultant detrimental effect upon commercial aviation in the Los Angeles Area.

The foreign air traffic of Los Angeles is growing rapidly and, in addition to the scheduled operations of Pan American Airways to Hawaii and Mexico from Los Angeles Airport, four other carriers now provide international service. Dutch KNILM and Matson Lines both use the Lockheed Air Terminal as headquarters for non-scheduled operations, while Pacific Overseas Airlines Corporation and Pacific Overseas Airlines Siam, Ltd., use the Ontario International Airport as a base for scheduled and non-scheduled overseas flights. With scheduled foreign flights amounting to twenty-two weekly, and non-scheduled movements ranging

between eight and twelve a week, it is safe to assume that Area 2 will have ten daily foreign in and out flights in 1950 and probably fifteen to twenty daily foreign in and out flights in 1955, all of which will add to the burden of major terminal airports in that area.

Southwest Airways has made application for additional feeder line operation in Southern California with stops at several points within Area 2. On the Los Angeles to Yuma flights, it is proposed to serve Ontario-Pomona and Riverside-San Bernardino, while on the Los Angeles to San Diego flights service is proposed to Long Beach, Fullerton, Santa Ana and Laguna Beach. Undoubtedly, this comprehensive pattern of scheduled airline operation will generate additional traffic that would not otherwise be attracted to air transportation and, summarily, will increase the anticipated passenger potential of the area.

Within Los Angeles County, the Elysian Park and El Monte areas seem to offer the best possible sites for additional major terminal airports. A Class 4 or larger facility will be needed in the Riverside-San Bernardino Area by 1948, with expansion to a Class 5 by 1955. Orange County is reasonably well served by the county-owned Class 4 airport located near Santa Ana, although plans should be made to enlarge this facility to Class 5 by 1955.

Both Fullerton and Laguna Beach will require a minimum of Class 3 facilities by 1948, with expansion possibly necessary at a later date, depending upon the traffic volume developed at these two locations.

PRIVATE FLYING ESTIMATES

The following estimate of private aircraft ownership derived as explained in Part V is presented for ready access in analyzing the needs of Area 2 for airports to accommodate privately owned aircraft.

<i>County</i>	<i>Potential Owner Index</i>	<i>Estimated Ownership 1950</i>	<i>1955</i>
Los Angeles -----	110	8,310	19,505
Orange -----	121	432	1,012
West Riverside -----	120	258	604
S. W. San Bernardino 94		388	910
Area Total -----	110	9,388	22,031

Distribution of this potential within the several counties has been undertaken by weighting population distribution by judicial townships according to the average rental for the township. Upon this basis the projection is further broken down as follows:

ORANGE COUNTY

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
Anaheim -----	17.68	77	179
Brea -----	4.93	21	50
Fullerton -----	10.59	46	107
Huntington Beach -----	7.94	34	80
Laguna Beach -----	7.16	31	73
Newport Beach -----	10.76	47	109
Orange -----	8.39	36	85
San Juan -----	1.90	8	19
Santa Ana -----	25.74	111	261
Seal Beach -----	2.61	11	26
Tustin -----	2.30	10	23

WESTERN RIVERSIDE

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
Beaumont -----	3.66	9	22
Elsinore -----	3.74	10	23
Hemet -----	6.90	18	42
Highgrove -----	1.34	3	8
Murrieta -----	1.09	3	7
Perris -----	8.36	22	50
Riverside -----	53.97	139	326
San Jacinto -----	3.03	8	18

Temescal -----	12.67	33	76
West Riverside -----	5.24	13	32

SOUTHWEST SAN BERNARDINO

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
Bear Valley -----	.90	3	8
Bloomington -----	2.49	10	23
Chino -----	4.57	18	42
Colton -----	7.29	28	66
Cucamonga -----	2.78	11	25
Etiwanda -----	0.55	2	5
Fontana -----	2.83	11	26
Highland -----	5.97	23	54
Mission -----	2.88	11	26
Ontario -----	11.95	46	109
Redlands -----	9.06	35	82
Rialto -----	2.00	8	18
San Bernardino -----	40.40	157	368
Upland -----	4.61	18	42
Yucaipa -----	1.72	7	16

LOS ANGELES COUNTY

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
Antelope -----	0.17	14	33
Belvedere -----	0.94	78	183
Beverly Hills -----	4.04	336	788
Calabasas -----	0.04	3	8
Catalina -----	0.18	15	35
Compton -----	1.54	128	300
Downey -----	1.14	95	222
El Monte -----	1.38	115	269
Glendale -----	5.37	446	1,047
Inglewood -----	3.91	325	763
Long Beach -----	6.32	525	1,233
Los Angeles -----	51.87	4,310	10,117
Malibu -----	0.08	7	16
Monrovia -----	1.69	140	330
Montebello -----	1.67	139	326
Pasadena -----	5.71	475	1,114
San Antonio -----	4.53	376	884
San Fernando -----	0.22	18	43
San Gabriel -----	3.69	307	720
San Jose -----	1.17	97	228
Santa Monica -----	2.13	177	415
Signal Hill -----	0.20	17	39
Soledad -----	0.12	10	23
Venice -----	0.83	69	162
Whittier -----	1.06	88	207

AIRPORT REQUIREMENTS

The problems presented in estimating the airport requirements of this huge metropolitan area contiguous to the city of Los Angeles surpass in magnitude the planning required for several entire states. This comparison is forcibly illustrated by the following tabulation:

	<i>Land Area Square Miles</i>	<i>Latest Population</i>
Area 2—Los Angeles Met.-----	7,153	4,089,555
State of Rhode Island-----	1,058	770,577
State of Delaware-----	1,978	302,168
State of Connecticut-----	4,809	1,939,956
State of New Jersey-----	7,522	4,528,417
State of Massachusetts-----	7,907	4,501,555

Planning for Area 2, therefore, involved considerations equal to planning for the State of Massachusetts

or the State of New Jersey plus the special considerations dictated by a large percentage of desert and extremely mountainous terrain and a rapidly-increasing population estimated to reach 5,024,350 before 1955. Quite obviously the detailed planning necessitated by a problem of this magnitude is beyond the scope of a general State treatment such as this report and should be made the basis for continued intensive local study comparable to that given the airport problems in the two states mentioned.

This report has, however, developed sufficient factual information and projections to indicate in a general way the points of greatest need and to enable an overall appraisal of the situation—present and future.

As was pointed out in Part IV, Section 2 of the body of this report, Area 2 is the most in need of additional airport facilities of any of the fourteen Areas of the State. It ranks eighth in overall aeronautical appraisal. Its position is due largely to the concentra-

tion of population and aeronautical activity in Los Angeles County but to a lesser degree it applies to the entire Area. The following tabulation showing the Area standing with respect to the State indicates quite clearly the major weaknesses:

SUMMARY OF AERONAUTICAL APPRAISAL—AREA 2
COMPARED TO THE STATE

Source Table No.		State Total	Area 2	Percent of State Total
63	Population 1946.....	9,335,000	4,089,535	43.81
54	Civil Airports.....	409	74	18.09
50	Public.....	202	18	8.91
52	Commercial.....	207	56	27.05
54	Airports per 100M Population.....	4.381	1.81	41.32
55	Civil Airports Weighted.....	2,043	345	16.89
55	Public.....	1,316	131	9.95
55	Commercial.....	727	214	29.44
55	Weighted Units per 100M Population.....	21.9	8.4	38.36
60	Registered Aircraft (10-15-46).....	7,200	3,838	53.31
60	Aircraft per 10M Population.....	7.71	9.38	121.66
	Aircraft per Airport—1946.....	17.60	51.86	294.7
	Aircraft per Weighted Unit.....	3.52	11.12	315.9
73	Projected Aircraft—1950.....	19,100	9,388	49.15
†	Weighted Units of Airport Indicated.....		469	
	Percent Increase Indicated over 1946.....		35.9	
73	Projected Aircraft—1955.....	44,400	22,031	49.62
†	Weighted Units of Airport Indicated.....		1,102	
	Percent Increase Indicated over 1950.....		134.8	
	Percent Increase Indicated over 1946.....		219.4	

† At average of 20 aircraft per unit of weight of airport.

With the foregoing projection in view, the adequacy of existing facilities will be discussed and recommendations made for suitable development.

ORANGE COUNTY

Aircraft ownership in Orange County approximated 200 at the close of 1947. Airport facilities were adequate although distribution left much to be desired. Projections for the county indicate 432 by 1950 and 1,012 by 1955 denoting a 116 percent increase in the next three years and a 406 percent increase by 1955.

The county now has one public Class 4 airport at Santa Ana and two public Class 1 airports—Fullerton and Huntington Beach. These are augmented by one Class Sub-2, four Class 1 and two Class Sub-1 privately-owned commercial airports. Absolute capacity of the present total is not to exceed 600 airplanes, hence the necessity for additional facilities soon after 1950.

Orange County Airport—Santa Ana

This Class 4 airport will adequately serve the needs of Santa Ana—the county seat—for feederline and potential cargo and provide an operating base for at

least 200 private aircraft. The potential for the three townships contiguous—Newport Beach, Santa Ana and Tustin—is 168 for 1950 and 393 for 1955. It appears, therefore, that additional airport capacity will be needed soon after 1950. The following recommendation will relieve this situation:

Huntington Beach

This Class 1 airport serves Huntington Beach township which has a potential of 34 aircraft in 1950 and 80 in 1955. In addition it serves an important beach and park area. Its 1955 total will be augmented by an overflow from Santa Ana and Newport Beach townships, giving it a 1955 potential of approximately 200 aircraft. To serve this potential and provide accommodations for aircraft visiting the beach area, it is recommended that a Class 2 facility be planned for Huntington Beach by 1955. The remaining excess from Santa Ana can be handled by the commercial airport at Costa Mesa if steps are taken to perpetuate it.

Seal Beach

The vicinity of this resort area is presently served by a commercial airport at Sunset Beach. The service

area includes all of East Long Beach, Belmont Shore, Naples, Surfside and Sunset Beach. As Long Beach airport nears capacity more of its potential will seek an outlet to the east. There is reason to believe that by 1955 Seal Beach will afford a potential of from 75 to 100 private aircraft plus an equal number of itinerants. It is therefore recommended that consideration be given to the establishment of a modern Class 1 airpark with "airtel" accommodations in the vicinity of Sunset Beach for 1955.

Laguna Beach—San Clemente

This renowned scenic and resort area is presently without adequate facilities for air transportation except for a Class Sub-1 privately-owned airport at San Juan Capistrano. The nearest facility for transport or larger private aircraft is at Orange County Airport, 12 miles distant from Laguna Beach by highway. There is pending a route application for feederline service to Laguna Beach. No suitable airport exists nor is there an adequate airport along the coast at any point between Santa Ana and Oceanside (a distance of 42 miles) on this important coastwise airway. Few suitable sites for airports or natural areas for emergency use exist. Laguna Beach, San Juan Capistrano and San Clemente have a combined potential of over 100 private aircraft for 1955. This potential, together with the needs of visitors to this attractive coastal area and the prospect of feeder air service justify planning a Class 3 facility in southeastern Orange County by 1955. A suggested location in the vicinity of Dana Point would serve the area well. Preliminary development of a Class 2 facility should begin at once.

Anaheim—Orange

The western portion of this rich agricultural area is tributary to Fullerton Airport to be discussed later. It is also served by commercial airports at Cypress and Buena Park, both of Class 1. The country adjacent to Anaheim and Orange on the east has always lacked good airport facilities. The potential private ownership of the area east of Anaheim and north of Santa Ana centering north of Orange is approximately 75 for 1950 and 200 for 1955 without detracting from the existing setup in the western section of Anaheim township. The natural air route through Santa Ana Canyon would also be served by the proposed facility. It is considered desirable to develop one of the suitable sites in this locality to a Class 2 facility by 1955. It should be located in the vicinity of Olive to serve its potential to best advantage.

Fullerton

The city of Fullerton has maintained a Class 1 airport just west of town for many years. It serves all of northwestern Orange County and its environs show a potential of 80 private owners for 1950 and approximately 200 for 1955. In addition, the prospect of feederline service to Fullerton within the year dictates

the immediate improvement of the present airport to Class 2 standards with ultimate improvement to Class 3 by 1955. No facility of this type presently exists within a ten mile radius other than the private airport of Consolidated-Vultee factory at Downey. The recommended development would adequately serve a large area including Fullerton, Buena Park, Bellflower, Norwalk, East Whittier and La Habra. Air cargo potential in this area also indicates this need. The development of all existing airports in Southern California to maximum useful capacity is insurance against their diversion to other uses as the population continues its phenomenal increase.

WESTERN RIVERSIDE COUNTY

The airports of Western Riverside County are with one exception sufficiently numerous and properly located to care for the anticipated private flying load in this area during the period being considered herein *if they are improved to the standards of the Class which they purport to represent*. The area is without suitable air transport accommodations except at neighboring Ontario International airport. This matter will be discussed under San Bernardino County.

Riverside

This attractive and thriving county-seat city is presently served by two commercial airports—a Class 2 at West Riverside and a Class S-2 at Arlington. If suitably improved to full standards and protected against diversion to other uses, it is believed that these airports would supply the potential of approximately 375 private aircraft through 1955. The Arlington airport should be improved to carry the bulk of this load by 1950 because of its more advantageous location.

Corona

The existing commercial Class 1 airport will meet the anticipated load at this location through 1955 if protected against diversion. Ultimate disposition of the handsome facility at Chino will affect the potential of the area north of Corona. If Cal-Aero surplus military field becomes available for civil use it should be acquired by San Bernardino County to serve all of that area south of Ontario, north of Corona and west of Mira Loma. It offers a splendid site for industrial development or for an aeronautical institute.

Elsinore

Two airports exist here where the potential indicates one would be ample. Neither is fully developed. The area around Elsinore is attractive to visitors affording boating, bathing and similar recreational features. Opportunity exists for the unification of effort in the development of one good airport to serve the needs of local and itinerant aviation. The better site should be selected and developed into an attractive resort airport with access to beach and the recreational facilities

afforded by this large expanse of fresh water. The local potential indicates a private plane registration of approximately 30 in the service area by 1955. Visitor potential and the needs of the Forest Service for access to the Cleveland National Forest in the Santa Ana Mountains to the west and south are added justification.

Perris

The town and township of the same name show a relatively high interest in private flying probably due to the long established March Field Army Air Base nearby. There is indicated a 1950 registration of 25 aircraft to be doubled by 1955. There is no record of a suitable base for this anticipated load. Airports at Riverside will reach capacity by 1955 but could handle the 1950 potential from Perris, although the distance to those airports would prove a disadvantage. It is recommended that a Class 1 airport be established at or near the town of Perris by 1955. The State Division of Forestry has recommended this facility.

Hemet—San Jacinto

This locality has ample airport facilities for the period through 1955 *if all existing airports are retained and properly maintained*. The presently surplus primary flying school at Hemet should be taken over by the city of Hemet or County of Riverside to serve all of Hemet and San Jacinto township requirements for private and itinerant flying. The several spas and the mountain hinterland bring thousands of visitors to the area monthly, many of whom will travel by air in the not-distant future.

SOUTHWESTERN SAN BERNARDINO COUNTY

That portion of the Nation's largest county lying toward the coast from the lofty mountains which separate it from the desert area to the north and east contains only 4.45 percent of the county's area but 88 percent of its people. Its population density is, therefore, nearly 16 times as high as that of the vast desert section of the same county. Because of the close community of interest between Southwestern San Bernardino, Western Riverside, Orange and Los Angeles Counties and, because of their natural location in the restricted coastal plain between their mountain backdrop and the ocean shore, they are commonly considered as one vast metropolitan area and are so treated in this report. The aeronautical needs of this four county community are so interwoven as to require consideration of the whole. For estimating the needs of private flying, however, the counties may be considered separately with due allowance for neighboring facilities near county lines.

The nucleus of this southwestern section of San Bernardino County consists of the alluvial plain upon which are located, in close proximity, the county seat of San Bernardino, and the cities of Redlands and Colton. These cities, with several smaller towns in their

immediate vicinity, have a combined population of over 100,000 and thus justify a combined potential of 262 private aircraft by 1950 and 614 by 1955. All of these figures are confined to the restricted and highly developed area included in San Bernardino, Colton, Mission, Highland and Redlands townships. It is presently served entirely by privately-owned commercial airports listed as follows:

Colton-Rialto	Morrow Field	Class 2
San Bernardino	Warren & Day	Class 2
San Bernardino	Tri-City	Class S-2
Redlands	(Mentone)	Class 1
Rialto-Fontana	Leach	Class 1

The foregoing inventory of airports appears adequate for present and projected needs of private flying in the San Bernardino environs but the following considerations govern.

The whole community, including Riverside ten miles south, is without a suitable airport for air transport or cargo operations. The need therefor is apparent from perusal of the scheduled air transport potential included in this area treatment. The San Bernardino Army Air Depot has a magnificent Class 6 airport which may possibly be declared excess to AAF needs, although the matter is not yet decided. Community interests strongly oppose the suggestion as being detrimental to national defense. If this facility is not made available to civil aviation within the next year, consideration must be given to providing adequate air transport facilities in the focal point of the community.

Rialto—Colton (Morrow Field)

In the eventuality described above it is recommended that Morrow Field, conveniently located to all of the people of the San Bernardino, Redlands, Riverside, Colton triangle, be developed into a Class 4 airport by 1950 to provide air carrier service already authorized to the 165,485 population estimated for this community in 1950 and also to serve projected feeder-line service to connect it with Los Angeles and other Southern California centers of population. This expansion would materially reduce the private flying load on the remaining commercial airports, and provide an adequate air cargo terminal for the extensive air shipments of the perishable agricultural products of this community envisioned in the near future.

San Bernardino (Tri City Airport)

This long established Class Sub-2 airport serves the non-scheduled aviation needs of the triangular area between, and including parts of, the cities of San Bernardino, Colton and Riverside. Its tributary area has a 1955 potential of some 300 privately owned aircraft. Development to full Class 2 standards by that date is recommended.

Bear Valley

This popular mountain resort region surrounding Big Bear Lake in the San Bernardino mountains 30 air

miles east of the city of San Bernardino long has been a mecca for vacationists and aviation enthusiasts. The elevation of 6,850 feet demands that airport facilities be up to standard specifications. The present Class Sub-1 facility is neither safe nor adequate to the needs of this popular all year recreational region. The heavily forested watershed is constantly menaced by the fire hazard, for which reason the Federal Forest Service recommends the development of a standard airport in this region. This study concurs in the need for a new Class 1 airport in Bear Valley in 1950 to be expanded to full Class 2 requirements by 1955.

Fontana

The potential non-scheduled flying activities of this locality will be adequately cared for by the airport recently acquired by the county from war surplus. This Class 1 facility must be preserved and maintained to care for an estimated 1950 load of 30 aircraft and a 1955 potential of 75 aircraft in its immediate neighborhood.

Ontario

The aeronautical needs of this metropolis of southwestern San Bernardino County are provided for adequately by the fine Class 5 airport recently returned to the city after war time occupancy and improvement by the Army Air Forces. Located midway between San Bernardino and Los Angeles, Ontario International Airport not only cares for the potential of some 150 local aircraft by 1955 but also provides an

excellent air transport and cargo terminal, which is already the base for extensive overseas air transport operations and may ultimately serve both feeder and mainline domestic air transport. Its location 39 miles east of downtown Los Angeles makes it readily available as an alternate airport for transport aviation in emergencies. Its regular use as such is precluded at present by lack of freeways for surface transportation to the metropolitan centers. However, the airport situation in Area 2 is immeasurably benefited by the existence of this excellent facility so centrally located and its ultimate full use may be confidently expected.

LOS ANGELES COUNTY

The people of Los Angeles County are air-minded to a degree seldom equaled in a metropolitan area. The county per capita ownership of aircraft is 20 percent above the State average and 81 percent above the national average. The county per capita utilization of air transport is 14 percent above the State average which in turn is nearly five times the national average.

Obviously in a congested region such as this, dotted with cities and interspersed with hilly sections, the opportunities for airport development are not numerous. Yet the potential growth of civil aviation in the next eight years portends a six fold increase for the county indicating at least a three-fold increase in airport facilities. The standing of Los Angeles County with respect to the State on matters aeronautical is indicated by the following tabulation:

AERONAUTICAL APPRAISAL OF LOS ANGELES COUNTY
COMPARED TO THE STATE

Source Table No.		State Total	Los Angeles County	Percent of State Total
63	Population 1946.....	9,335,000	3,597,500	38.54
54	Civil Airports.....	409	41	10.02
50	Public.....	202	10	4.95
52	Commercial.....	207	31	14.98
54	Airports per 100M Population.....	4.381	1.14	26.02
55	Civil Airports Weighted.....	2,043	218	10.67
55	Public.....	1,316	84	6.38
55	Commercial.....	727	134	18.43
55	Weighted Units per 100M Population.....	21.9	6.1	27.85
60	Registered Aircraft (10-15-46).....	7,200	3,327	46.21
60	Aircraft per 10M Population.....	7.71	9.25	119.97
	Aircraft per Airport—1946.....	17.60	81.15	461.1
	Aircraft per Weighted Unit.....	3.52	15.26	433.5
73	Projected Aircraft—1950.....	19,100	8,310	43.51
†	Weighted Units of Airport Indicated.....		416	
	Percent Increase Indicated over 1946.....		90.8	
73	Projected Aircraft—1955.....	44,400	19,505	43.93
†	Weighted Units of Airport Indicated.....		975	
	Percent Increase Indicated over 1950.....		134.4	
	Percent Increase Indicated over 1946.....		347.3	

† At average of 20 aircraft per unit of weight of airport.

The observations made above concerning Area 2, as a whole, are even more appropriate when applied to Los Angeles county where 38.54 percent of the State's population, or 3,597,500 people, live in one county. But the northern 70 percent of that county is mountainous and sparsely populated, hence 97.5 percent of the county's population, or 3,507,000 people, occupy 30 percent of its 4,071 square miles of area, or the 1,220 square miles lying between the San Gabriel-Santa Susana Mountains and the Pacific Ocean. The population density of this thickly-populated area is therefore 2,875 persons per square mile compared to a State average of 59.5. In this 30 percent of the county which is slightly larger than the entire State of Rhode Island, a population five times that of Rhode Island is comfortably domiciled. That population is currently increasing at an estimated rate of 15,000 per month.

Here in a confined coastal plain between mountains and the sea lie the cities of Los Angeles with its 1,805,700 people, Long Beach with its 241,000, Glendale and Pasadena with 100,000 each, three cities in the 50,000 class, eight in the 25,000 class, fourteen between 10 and 20,000, seven between 5 and 10,000 and ten under 5,000—a total of 46 incorporated cities, each with its own government, each going its own way as regards airport development.

Of the county's population 84.6 percent is urban and 13.5 percent rural non-farm with the remaining 1.9 percent classed as farm dwellers. Notwithstanding, the county is the richest agricultural county in the United States in value of its farm produce.

In treating the airport requirements of this highly specialized area in the scope of this report the approach must of necessity be general. Accordingly the southern 30 percent, or congested area, of the county has been divided into 12 Sectors, 8 of which radiate from and include that portion of the central metropolitan core from which they might logically expect to attract airplane owners to their suburban airports. The remaining 4 sectors are located too far from Los Angeles to be considered tributary thereto, and in each case they constitute a cluster of communities having individual problems. The sectors are briefly described as follows:

Sector 1—Santa Monica

Includes west bay area from crest of Santa Monica Mountains to south line of Culver City, all of Beverly Hills, and the Los Angeles Wilshire and Westlake Districts.

Sector 2—Inglewood

Includes area contiguous to Los Angeles Airport, from south boundary of Culver City to south boundary of Hermosa Beach, and east to Vermont Avenue, including cities of Hermosa Beach, Manhattan Beach, El Segundo, Hawthorne, Gardena, Lennox, Inglewood and the southwestern section of Los Angeles city.

Sector 2-a—Torrance

Includes area south of Sector 2, embracing Torrance, Redondo Beach, Palos Verdes Estates, Lomita, Harbor City, Wilmington and San Pedro.

Sector 3—Compton

Area to the east of Sector 2 which includes the southern part of Los Angeles and cities of Huntington Park, Walnut Park, South Gate, Willowbrook, Lynwood, Compton, Clearwater, Hynes and Bellflower.

Sector 3-a—Long Beach

Bounded by Sector 2-a on the west and Sector 3 on north. Includes Dominguez, North Long Beach, Artesia, Lakewood Village, Signal Hill and all of the City of Long Beach. Bounded by Los Angeles County Line on east.

Sector 4—Montebello Sector

Bounded by Sector 3 on the south, San Gabriel River on the east and Monterey Hills on the north. Includes east section of Los Angeles, Vernon, Maywood, Bell, Belvedere Gardens, East Los Angeles, Montebello, Pico, Rivera and Downey.

Sector 4-a—Whittier

Includes Los Angeles County territory east of the San Gabriel River and south of Puente Hills to east county line. Includes Whittier, Los Nietos, Santa Fe Springs and Norwalk.

Sector 5—Alhambra Sector

Bounded by Sector 4 on the south, San Gabriel River on east, Arroyo Seco and Pasadena City Limits on north. Includes northeastern Los Angeles, Alhambra, San Marino, San Gabriel, Wilmar, Monterey Park, Garvey, El Monte, Rosemead and Temple City.

Sector 5-a—Pomona

Includes the section of Los Angeles County south of Sierra Madre Mountains, east of San Gabriel River, north of Puente Hills and west of the county line, containing the cities of Azusa, Glendora, San Dimas, LaVerne, Baldwin Park, West Covina, Covina, Puente, Walnut, Claremont and Pomona.

Sector 6—Pasadena

Bounded on west by Arroyo Seco, north by Sierra Madre Mountains, east by San Gabriel River and south by Sector 5. Includes South Pasadena, Pasadena, Sierra Madre, Arcadia and Monrovia.

Sector 7—Glendale

Includes northern part of Los Angeles (Elysian and Griffith Park Sections) and area north and west of Arroyo Seco to east Burbank city limits, all of Glendale, Eagle Rock, Highland Park, Flintridge, La Canada, Montrose and La Crescenta to Sierra Madre Mountains on north.

Sector 8—San Fernando Valley

Includes Hollywood section of Los Angeles and all of San Fernando Valley north of Santa Monica Mountains, to western city limits of Los Angeles, north to Santa Susana and Sierra Madre Mountains and east to eastern Burbank city limits. This includes cities and towns of Burbank, Magnolia Park, North Hollywood, Van Nuys, Encino, Reseda, Northridge, Calabasas,

Canoga Park, Chatsworth, San Fernando, Sunland, Tujunga and Roscoe.

The 1940 population in each of these sectors was accurately computed by census tracts, reduced to percentage of the county total, weighted with respect to average rentals and estimated increases in each sector, and converted into potential aircraft registrations by sectors, for the years 1950 and 1955, as shown in the following tabulation:

	Population 1940 Census 1st Series	Percent of 1940 Population	Weighted Population Distribution*	Estimated Aircraft 1950†	Estimated Aircraft 1955†
Los Angeles County.....	2,785,643	100.00	100.00	8,310	19,505
1 Santa Monica Sector.....	536,745	19.27	31.0	2,576	6,046
2 Inglewood Sector.....	302,060	10.84	8.5	706	1,658
2a Torrance Sector.....	88,253	3.17	2.7	224	527
3 Compton Sector.....	371,869	13.35	7.0	582	1,365
3a Long Beach Sector.....	181,946	6.53	7.0	582	1,365
4 Montebello Sector.....	308,192	11.06	5.9	490	1,151
4a Whittier Sector.....	35,785	1.28	1.6	133	312
5 Alhambra Sector.....	183,015	6.57	5.3	441	1,034
5a Pomona Sector.....	66,179	2.38	2.7	224	527
6 Pasadena Sector.....	142,012	5.09	5.3	440	1,034
7 Glendale Sector.....	278,083	9.99	10.7	889	2,087
8 San Fernando Valley Sector.....	222,228	7.98	10.2	848	1,989
Sector Totals.....	2,716,367	97.51	97.9	8,135	19,095
County Outside Sectors.....	69,276	2.49	2.1	175	410

* Weighted with respect to average rentals in each sector and to estimated changes in population distribution since 1940.

† Estimated county totals from Table 73.

While the foregoing estimates may seem fantastic at present it must be remembered that aircraft ownership in California has tripled since the war and that a large percentage of that increase occurred in the area under discussion. A mere doubling in the next three years would satisfy the 1950 estimate. Whether the 1955 estimate be reached in that year or in 1960 *it will be reached and passed ultimately*, and the problem presented can never be simplified by procrastination. It will become more difficult of solution with each passing year. Since this study is intended to be an estimate only of California's airport needs, a statement of the requirements to meet the above projected load in each sector must suffice.

Sector 1—Santa Monica Bay Region

New Class 3 airport—near beach south of Venice..... 1950
 New Class 2 airport—Pacific Palisades area..... 1950
 New Class 1 airport—Point Dume..... 1950
 New Class 1 airport—Baldwin Hills area..... 1950

The foregoing might add a capacity for 800 aircraft which with present airports would provide facilities for half the 1950 potential load. The remainder and 80 percent of the 1955 projection must be accommodated elsewhere—probably in Sectors 2 and 8.

Sector 2—Inglewood

While the airports herein can accommodate the 1950 projection of the sector they must assume an equally large burden from Sector 2 and will require:

Development of Gardena Valley—Class 1 to
 Class 2 1950
 Development of Torrance Community—Class 1
 to Class 2 1950
 New Class 2 airport—Manhattan Beach..... 1950
 New Class 2—Gardena Vicinity..... 1950
 New Class 2—Southwest of Hawthorne..... 1950
 Develop Los Angeles Airport—Class 4 to Class 6..... 1950

Sector 2-a—Torrance-San Pedro

Facilities in this sector appear adequate for 1950, but will be called upon to bear an overflow of 420 from Sector 2 by 1955. Immediate new construction here is not as vital as in Sectors 1 and 2. Requirements are:

Develop Wilmington from Sub-1 to Class 2..... 1955
 New Class 1 airport—in Palos Verdes..... 1955
 New Class 1 airport—south of Gardena..... 1950
 New Class 1 airport—San Pedro..... 1955

Sector 3—Compton

Facilities in this sector will reach full capacity before 1950. Development to the south is still possible and should be safeguarded since no sites are available toward Los Angeles. Recommendations include:

Develop Compton Class S-2 to Class 3..... 1950
 New Class 2 airport—Dominguez Area..... 1955
 New Class 1 airport—SE Lynwood..... 1955
 New Class 2 airport—SE Southgate..... 1950
 New Class 2 airport—N. Long Beach..... 1955

EXISTING AIRPORTS AND PROJECTED LOADS—SOUTHERN LOS ANGELES COUNTY—BY SECTORS

	Existing Airports Serving Sector			Pres- ent Capa- city*	Projected Ownership		Remarks
	Name	Class	Category		1950	1955	
1. Santa Monica Sector.....	S. Monica.....	4	Public...	250	2,576	6,046	Load must go to Sectors 2 and 8
	Culver City..	S-2	Private..	150			
2. Inglewood Sector.....	Los Angeles..	4	Public...		706	1,658	Overload from 1 makes facilities inadequate
	Hawthorne...	4	Public...	250			
	Gardena.....	1	Private..	200			
	Community..	1	Private..	200			
2a Torrance Sector.....	Lomita Flight Strip.....	4	Public...	300	224	527	Must assume load from other sectors
	Wilmington...	S-1	Private..	100			
3. Compton Sector.....	Central.....	2	Private..	200	582	1,365	Utmost development recommended—1955
	Compton.....	S-2	Private..	200			
	Bellflower....	1	Private..	100			
3a. Long Beach Sector.....	Long Beach...	6	Public...	250	582	1,365	Double capacity—1950, Quadruple by 1955
	Artesia.....	S-2	Private..	100			
4. Montebello Sector.....	Vail.....	2	Private..	200	490	1,151	New Development Possible Here
	Montebello...	2	Private..	200			
4a. Whittier Sector.....	Norwalk.....	1	Private..	100	133	312	One additional airport by 1955
5. Alhambra Sector.....	Rosemead....	2	Private..	200	440	1,034	Must share Pasadena load
	El Monte.....	1	Private..	100			
5a. Pomona Sector.....	Puente.....	S-2	Private..	200	225	527	Must share overload from Sectors 5 and 6
	Pomona-Brackett.....	1	Private..	100			
	Pomona.....	1	Private..	100			
6. Pasadena Sector.....	Monrovia....	S-2	Private..	150	440	1,034	Some development possible
7. Glendale Sector.....	Grand Central	3	Private..	250	889	2,087	Expansion to the west only
8. San Fernando Valley Sector.....	Burbank.....	5	Private..	250	848	1,989	Represents principal opportunity for additional facilities
	Van Nuys....	5	Private..	300			
	Whiteman....	2	Private..	200			
	Weightman....	S-2	Private..	200			
	Northridge..	1	Private..	100			
	Canoga Park..	S-1	Private..	100			

*Present capacities shown above are absolute maximums which may be accommodated by the facilities listed.

Sector 3a—Long Beach

Long Beach Airport is listed for possible 250 private aircraft which with factory, Army Reserve and air carrier, will tax its capacity by 1950. Additional facilities will be required in this sector for almost 300 aircraft by 1950 and 1,000 by 1955 as follows:

New Class 2 airport—vicinity of Watson.....	1955
New Class 2 airport—southwest Artesia.....	1950
Improve present Artesia Class S-1 to Class 2	1950
New Class 2 airport east of N. Long Beach.....	1955

The foregoing improvements will still leave a 1955 potential of 315 aircraft to be cared for by proposed facilities in Orange County to the east and southeast of Long Beach.

Sector 4—Montebello

While the present facilities might conceivably care for the 1950 projection in this sector, they will be entirely inadequate for 1955. The following developments are recommended while yet possible:

Develop Vail Field—Class 2 airport to Class 3....	1950
New Class 2 airport—east of Bell.....	1950
New Class 2 airport—west of Santa Fe Springs....	1955
New Class 2 airport—vicinity of Pico.....	1955
Acquire Private Vulture Field at Downey—Class 3	1955

Sector 4a—Whittier

The vicinity of Whittier has no airport presently suited to larger aircraft, although Fullerton in neighboring Orange County is recommended for development to Class 3. There should be a good Class 2 airport

south of Whittier, and east of Norwalk, to provide for this sector through 1955:

New Class 2 airport—south Whittier----- 1955

Sector 5—Alhambra

The loss to this area, through the subdivision of Alhambra airport is severe. There has long been agitation in favor of a major airport in the Monterey Hills south of Monterey Park. Its development is recommended to serve nonscheduled flying in this thickly settled area. It affords ready access to downtown Los Angeles via Ramona Freeway.

The entire population of Sectors 5 and 6, numbering over 300,000, is 15 or more miles from scheduled airline service at Burbank, Los Angeles or Long Beach Terminals. There has long been contemplated an airline terminal in this quadrant of the Los Angeles suburban area which would afford easy and quick access to the many communities here located, and provide metropolitan Los Angeles with a major air terminal in each of four quadrants—a highly desirable arrangement. The favored site for such development lies northeast of El Monte in the San Gabriel Valley below the flood control dam. Its immediate development is urgently recommended.

New Class 2 airport—Monterey Park----- 1950
Develop El Monte Class 1 airport by stages to the
Proposed Class 5 San Gabriel Valley Airport to
absorb part of Pasadena potential—Class 2____ 1950
Class 5----- 1955
Develop proposed South Pasadena site to Class 2
airport ----- 1955
New Class 2 airport near Bassett----- 1955

Sector 5a—Pomona

While this sector has no urgent requirements for 1950, it must share the overflow from Sectors 5 and 6 by 1955 and will require the following additions:

Develop Pomona (Brackett) from Class 1 to
Class 2 ----- 1950
Develop Puente Sky Ranch from Class S-2 to
Class 2 ----- 1955
New Class 2—West Covina----- 1955

Sector 6—Pasadena

The potential of this sector exceeds all present capacity with few opportunities for expansion. The following sites shown on Los Angeles County Master Plan should be developed at once:

New Class 2—Arcadia----- 1950
New Class 2—East Pasadena----- 1950
New Class 1—Flintridge----- 1950
New Class 2—Sierra Madre----- 1950

Sector 7—Glendale

The Glendale sector is served exclusively by Grand Central Air Terminal which is nearing capacity. There are no other natural sites for airports in this area; hence the projected overflow of 600 for 1950 and 1,800 for 1955 will of necessity seek facilities in Sector 8 to the west.

Of major importance in this sector is the proposed Los Angeles Downtown Airport in Elysian Park, construction of which has long been advocated. It is considered an immediate necessity for Los Angeles downtown section:

Los Angeles Downtown—Class 5 (New)----- 1950

Sector 8—San Fernando Valley

This broad flat plain, 20 miles long and 10 miles wide, affords the largest single opportunity for expansion of airport facilities, in the Los Angeles area, but with the utmost expansion of existing airports and the construction of all possible new ones, it cannot meet the 1955 load indicated by its own potential of 2,000 and the overflow from Sectors 1 and 7. Hence, even before 1955 it will probably be necessary for owners of private aircraft to go further from Los Angeles for accommodations. The Palmdale and Antelope Valley area offers the only solution. The Los Angeles County Master Plan of Airports shows several sites in this valley which are not yet occupied by airports and immediate protection and development of these is recommended. The Army surplus Los Angeles Metropolitan Airport should be acquired by the City or County and developed to the limit of its capacity for cargo, repair base and miscellaneous commercial operations. Lockheed Air Terminal will continue to serve the air transport needs of this quadrant. Other recommendations follow:

Develop San Fernando—Class Sub-2 to Class 2____ 1950
Develop new Class 2 on county property adjacent
to Whiteman Airpark to increase its capacity__ 1950
New Class 2 in Tujunga Wash-Sunland----- 1950
New Class 2 near San Fernando Reservoir----- 1955
New Class 2 near Granada ----- 1950
New Class 2 near Chatsworth Reservoir----- 1955
New Class 2 north of Calabasas----- 1955
New Class 2 northwest of Tarzana----- 1950
New Class 2 in Sherman Oaks area----- 1950
New Class 2 north of Sepulveda----- 1950
New Class 2 east of Chatsworth----- 1955
Develop Canoga Park from Class Sub-1 to
Class 2 ----- 1950
Develop Northridge from Class 1 to Class 2----- 1950

The foregoing recommendations will provide adequately for 1950 projections for this area. For 1955 or later projections other developments than those listed herein will be required and plans must now be made accordingly.

Northern Portion of Los Angeles County

The Santa Clara valley adjacent to Saugus and Newhall offers opportunity for additional development. The Civil Aeronautics Administration facility at Newhall should be made into a modern Class 3 airport by 1955.

Further north, in the vicinity of Castaic there is opportunity for developing a Class 2 airport in 1955.

To the east the site of Schmidt Bros. Class 1 airport may be expanded to Class 2.

Forest Services desire a Class 2 airport at Alpine in Mint Canyon, and this is also necessary as an emergency field on a main airway.

Quail Lake near Gorman in northwestern Los Angeles County affords a site for a Forest Service and emergency facility sorely needed both for safety and forest protection in an area otherwise devoid of aeronautical facilities.

Antelope Valley and the towns of Lancaster and Palmdale are adequately provided with airports for the duration of this survey.

Palmdale Class 6 airport provides excellent emergency service to scheduled and non-scheduled aviation and must be perpetuated and improved by Los Angeles County.

Grey Butte, Class 2 airport provides the only airport in northeastern Los Angeles County and is an important emergency location on Green 4 Civil Air-

way. It should also be maintained by Los Angeles County.

War Eagle Field, west of Lancaster, is now in county possession and will serve non-scheduled aviation in North central Los Angeles County. No new developments in the Antelope Valley section are contemplated through 1955.

It cannot be recommended too strongly that Los Angeles County proceed at once in actual development or by fostering the commercial development of all of the airports recommended herein. The County has an immense stake in aviation. Its aircraft industry needs civilian business to prosper. Its people are air-minded. Its future stature in the Nation depends upon its acceptance of the air age as a reality. To repeat—it makes little difference whether the projections considered herein materialize in 1955 or 1965—they are certain to come eventually, and early planning will speed their coming.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 2

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Orange County							
Huntington Beach.....	Municipal.....	Public.....	1			2	NS,R
Seal Beach.....	Sunset.....	Private.....	S-1			1	NS,R
Laguna—San Clemente.....				2	FP,NS,R	3	FP,NS,R
Anaheim—Orange.....		Private.....	1			2	NS,FS
Fullerton.....	Municipal.....	Public.....	1	2	FP,NS	3	FP,NS
Western Riverside County							
Riverside.....	Arlington.....	Private.....	S-2	2	NS		
Elsinore.....		Private.....	S-2			2	NS,FS,R
Perris.....						1	NS,FS
Southwestern San Bernardino County							
Rialto.....	Colton.....	Private.....	2	4	AP,FP,C,NS	5	AE,FE,C,NS
San Bernardino.....	Tri City.....	Private.....	S-2			2	NS
Bear Valley.....		Private.....	S-1	1	R,FS	2	R,NS,FS
Los Angeles County							
Venice.....				3	NS,R		
Pacific Palisades.....				2	NS,R		
Point Dume.....				1	NS,R		
Baldwin Hills.....				1	NS		
Los Angeles.....	Municipal.....	Public.....	4	6	AE,FE,C		
Gardena Valley.....	Western Avenue.....	Private.....	1	2	NS		
Torrance.....	Community.....	Private.....	1	2	NS		
Manhattan Beach.....				2	NS,R		
Gardena (New).....				2	NS		
S.W. Hawthorne (New).....				2	NS		
Wilmington.....		Private.....	S-1			2	NS
Palos Verdes Estates.....						1	NS
South Gardena.....				1	NS		
San Pedro.....						1	NS
Compton.....	City.....	Private.....	S-2	3	NS		
S.E. Lynwood.....						1	NS
Dominguez Area.....						2	NS
South Gate.....				2	NS		
N. Long Beach.....						2	NS
Watson.....						2	NS
S.W. Artesia.....				2	NS		
Artesia.....	Cranford.....	Private.....	S-2	2	NS		

CALIFORNIA AIRPORTS

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 2—Continued

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Los Angeles County—Continued							
East of N. Long Beach.....						2	NS
Montebello.....	Vail.....	Private.....	2	3	NS		
East of Bell.....				2	NS		
West of Santa Fe Springs.....						2	NS
Vicinity of Pico.....						2	NS
South Whittier.....						2	NS
Monterey Hills—Monterey Park.....				2	NS		
San Gabriel Valley.....	El Monte.....	Private.....	1	2	NS	5	AP,FP,C,NS
South Pasadena.....						2	NS
Bassett.....						2	NS
Pomona.....	Brackett.....	Private.....	1			2	NS
Puente.....	Sky Ranch.....	Private.....	S-2	2	NS		
West Covina.....						2	NS
Arcadia.....				2	NS		
East Pasadena.....				2	NS		
Sierra Madre.....				2	NS		
Flintridge.....				1	NS		
Los Angeles.....	Downtown.....			5	AE,FE		
San Fernando.....	Weightman.....	Private.....	S-2	2	NS		
San Fernando.....	Whiteman.....	Private.....	2	2	NS (Rearrange)		
Sunland.....				2	NS		
San Fernando Reservoir.....						2	NS
Granada.....				2	NS		
Chatsworth Reservoir.....						2	NS
Calabasas.....						2	NS
Tarzana.....				2	NS		
Sherman.....				2	NS		
Selpulveda.....				2	NS		
East of Chatsworth.....						2	NS
Canoga Park.....	Reese.....	Private.....	S-1	2	NS		
Northridge.....	Neggins.....	Private.....	1	2	NS		
Newhall.....	CAA.....	CAA.....	S-3			3	AE,NS,FS
Castaic.....		Private.....	S-2			2	NS
Saugus.....	Schmidt.....	Private.....	1			2	NS
Alpine.....				2	NS,FS		
Gorman—Quail Lake.....				2	NS,FS,R		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

APPENDIX 3

AREA 3—DESERT REGION

NATURAL CHARACTERISTICS

Area 3 is the largest aviation area in California and consists of Imperial County and that part of San Bernardino and Riverside Counties not included in the Los Angeles Metropolitan Area.

Geography and Topography

This huge Desert Area of 18,748,160 acres is located in the southeastern corner of the State. It adjoins Mexico on the south, Arizona and Nevada on the east, Inyo County on the north, and Kern, Los Angeles, Orange, and San Diego Counties on the west. Sloping eastward from the San Jacinto and San Bernardino mountains to the Colorado River, the region is made up of alternate deserts and agricultural valleys rendered fertile and productive by irrigation. The Colorado Desert extends from the San Bernardino Range to the Palo Verde Valley and the Colorado River. The vast Mohave Desert stretches from the same mountains north through Inyo County and east across San Bernardino County to the Colorado River in a succession of desert valleys and low mountain ranges. Coachella Valley, in the central portion of Riverside County, extends for 65 miles in a northwesterly direction from the Salton Sea. Imperial Valley, containing 612,000 acres, forms a central basin which inclines north from the Mexican border to the Salton Sea.

There are no important rivers, and extensive supplemental water supplies have been developed, notably in the Imperial and Coachella Valleys, and the Yuma-Gila district of Imperial County, to combat the natural non-productivity of the Area. The Imperial Irrigation District has completed one of the greatest irrigation projects in the world. Water is diverted from the Colo-

rado River to cultivated regions through 1,750 miles of canals.

Land Usage

Before considering the land usage of Area 3 it should be pointed out that 16,785,000 acres* or 89 percent of the total is classified as desert. Another unusual factor is that 75 percent of the total Area is publicly owned. The following table indicates the total land usage, from Table 15:

Land used for crops-----	364,976 acres
Idle cropland and arable pasture-----	165,351 acres
Farm Woodland -----	411,028 acres
Forest and all other-----	3,582,378 acres
<hr/>	
Total privately owned land-----	4,523,733 acres
National Parks and Forests-----	1,372,384 acres
Other public lands-----	12,852,043 acres
<hr/>	
Total public lands-----	14,224,427 acres

* Source: Forest Survey Release No. 4.

Climate

In general, Area 3 has a typical desert climate, with long hot summers and little rainfall. Indio, representative of the Area, is 20 feet below sea level and has an average rainfall of 3.15 inches. January temperatures range between 38 and 70 degrees and July temperatures from 78 to 107. Low humidity prevails, moderating the effect of extreme summer temperatures. As higher elevations are encountered the extremes are less pronounced due to the influence of the westerly breezes from the coast and the warm desert air from the east. These combined climatic factors hold especial interest for recreational visitors and health seekers.

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

An examination of the industries of the Area shows an intensive development of agriculture with an air freight potential second in rank among the Areas of the State. Recreational facilities are well developed and require adequate airplane passenger service. Mineral production is another important industry in this Area's economy and improved accessibility should greatly accelerate its growth. Steady increases in population and per capita incomes have been maintained

and offer an augmented market for private planes and air passenger travel.

Agriculture

The Imperial and Coachella Valleys combine to give Area 3 an important position in California's agricultural industry. Cash farm income increased from \$31,160,000 in 1940 to \$82,105,000 in 1945. Inasmuch as the land in farms is only 5 percent of the Area total, the following table of carload shipments for 1945 presents an astounding volume.

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Imperial	Desert Riverside
Beans (Snap and Lima).....	9	-----
Broccoli.....	116	-----
Cabbage.....	340	-----
Cantaloupes.....	4,569	435
Carrots.....	6,049	210
Cauliflower.....	-----	104
Casabas.....	2	-----
Celery.....	16	-----
Corn (Green).....	-----	180
Cucumbers.....	-----	11
Egg Plant.....	-----	2
Grapefruit.....	365	259
Grapes.....	52	430
Greens (Except Spinach).....	22	-----
Honeyball Melons.....	339	35
Honeydew Melons.....	1,060	777
Lettuce and Romaine.....	12,543	806
Mixed Citrus Fruit.....	1	-----
Mixed Melons.....	525	16
Mixed Vegetables.....	573	127
Onions.....	33	86
Peas (Green).....	693	-----
Persian Melons.....	1	-----
Tomatoes.....	40	-----
Watermelons.....	747	203
Total.....	28,095	3,681
Grand Total.....	-----	31,776

Source: *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

In 1940 Imperial County alone ranked first in the production of lettuce, cantaloupes, carrots, peas and flax. The increase in cash farm income in recent years is illustrated by a comparison of the totals for 1940 and 1945.

The perishable nature of the Area's major crops and the fact that they mature and are harvested throughout the year, results in air freight potentials only exceeded by one other Area. These potentials will be given later.

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	Percent Change 1940 to 1945
United States.....	\$8,343,000	-----	100.00	\$20,780,900	-----	100.00	149.08
California.....	672,923	100.00	8.06	1,786,497	100.00	8.60	165.48
Imperial.....	21,000	3.12	.25	56,631	3.17	.27	169.67
Desert Riverside*	4,750	.70	.06	11,755	.66	.06	147.48
Desert San Bernardino*	2,880	.43	.03	7,360	.41	.03	155.56
Total Area 3.....	\$28,630	4.25	.34	\$75,746	4.24	.36	164.57

* Estimated apportionment of county totals.

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States, 1946*.

Timber Production

The forests of Area 3 contribute little to its economy except from a recreational standpoint. Visitors to the forests and parks require adequate airport facilities and the State Division of Forestry has requested one additional Class 1 airport at Anza in Riverside County.

Mineral Production

This Area contains the most varied metallic and non-metallic mineral deposits in California. During the war years mineral production was concentrated in industrial and chemical raw materials such as cement, stone, gypsum, borax and potash. Tale, zinc, gold, silver, copper, and lead were also produced. The value of mineral production in 1945 exceeded \$13,000,000. Because of the great size of the Area airplanes can be used to advantage in surveying mineral districts and transporting personnel to the mines.

Manufacturing

Area 3 does not provide natural characteristics attractive to manufacturing, hence this industry contributes a smaller amount to its economy. A noteworthy exception is the potash producing plant at Trona, on Searles Lake, the largest in the nation. Other chemical products are soda and soda ash, borax, and boric acid.

Food manufacturers include wineries, canneries and the processing of dates. Imperial County has recently established one of the largest beet sugar factories in the West.

Tourist and Travel Industry

The Area offers many tourist attractions. The unique Joshua Tree National Monument attracted 34,420 visitors in 1946. In the same year the visitors to the State Parks of Mt. San Jacinto and Indian Creek Grove numbered 13,000.

During the winter season, the San Bernardino and San Jacinto Mountains are a mecca for winter sports enthusiasts. Summer finds the same locales experiencing a great influx of tourists interested in swimming, boating and fishing. On the valley floor below, Palm Springs has gained a wide reputation for its winter climate and resort hotels. Throughout the Area dude ranches and health resorts are numerous. Climatic conditions offer relief to sufferers from respiratory disorders.

In order to serve adequately this fluid population, greater airplane facilities are needed than population figures would indicate. A detailed analysis of these needs will be given later.

Indices of Purchasing Power

The indices shown in Table 98 show an increase in bank deposits for this Area greater than that for the State from 1941 through 1944. In 1940 the per capita individual income was the lowest in California but by 1945 it had increased to eighth position. Both factors are, no doubt, a reflection of the enormous growth of agricultural production mentioned earlier as a compelling need for further improvement and development of air cargo facilities.

TABLE 98
INDICES OF PURCHASING POWER FOR AREA 3
Per Capita Assessed Valuation ^c—1930, 1935, 1940, and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Imperial.....	\$55,893,588	\$918	51.09	-----	\$44,839,404	\$782	71.81	—14.82
Desert Riverside*.....	21,168,890	1,040	57.87	-----	20,444,864	893	82.00	—14.14
Desert San Bernardino*.....	15,402,851	1,077	59.93	-----	17,254,421	1,047	96.14	—2.79
Totals.....	\$92,465,329	\$967	53.81	-----	\$82,538,689	\$854	78.42	—11.69
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Imperial.....	\$36,175,677	\$606	58.66	—22.51	\$42,218,298	\$736	52.42	21.45
Desert Riverside*.....	21,947,667	832	80.54	—6.83	28,530,467	1,246	88.75	49.76
Desert San Bernardino*.....	15,723,812	813	78.70	—22.35	19,821,112	1,203	85.68	47.97
Totals.....	\$73,847,156	\$700	67.76	—18.03	\$90,569,877	\$937	66.74	33.86

CALIFORNIA AIRPORTS

TABLE 98—Continued
 INDICES OF PURCHASING POWER FOR AREA 3
 Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
 (In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Imperial.....	\$9,436	.22	\$14,664	.27	\$21,136	.30	\$26,301	.30
Desert Riverside*.....	6,592	.16	10,375	.19	15,266	.21	19,682	.23
Desert San Bernardino*.....	4,207	.10	6,267	.11	9,301	.13	12,508	.14
Totals.....	\$20,235	.48	\$31,306	.57	\$45,703	.64	\$58,491	.67

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Imperial.....	\$32,250	\$530	93.64	-----	\$19,116	\$333	86.95	—37.17
Desert Riverside*.....	9,385	461	81.45	-----	7,487	327	85.38	—29.07
Desert San Bernardino*.....	6,838	478	84.45	-----	5,106	310	80.94	—35.15
Totals.....	\$48,473	\$507	89.58	-----	\$31,709	\$328	85.64	—35.31
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Imperial.....	\$23,721	\$397	86.12	19.22	\$35,430	\$593	80.24	49.37
Desert Riverside*.....	9,740	369	80.04	12.84	21,182	803	108.66	117.62
Desert San Bernardino*.....	7,170	371	80.48	19.68	16,103	833	112.72	124.53
Totals.....	\$40,631	\$385	83.51	17.38	\$72,715	\$690	93.37	79.22

Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Imperial.....	24,897	.41	113.89	-----	19,963	.35	100.00	—14.64
Desert Riverside*.....	7,582	.37	102.78	-----	8,447	.36	102.86	—2.70
Desert San Bernardino*.....	5,199	.36	100.00	-----	5,637	.34	97.14	—5.56
Totals.....	37,678	.39	108.33	-----	34,047	.35	100.00	—10.36
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Imperial.....	24,017	.40	100.00	14.29	17,890	.32	103.23	—20.00
Desert Riverside*.....	10,503	.40	100.00	11.11	11,260	.34	109.68	—15.00
Desert San Bernardino*.....	7,775	.40	100.00	17.64	8,527	.32	103.23	—20.00
Totals.....	42,295	.40	100.00	14.29	37,677	.32	103.23	—20.00

TABLE 98—Continued
INDICES OF PURCHASING POWER—AREA 3
Per Capita Individual Incomes^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Imperial.....	\$32,499	\$544	67.75	\$77,518	\$1,394	101.46	156.25
Desert Riverside*.....	13,035	494	61.52	31,822	948	69.00	91.90
Desert San Bernardino*.....	10,605	549	68.37	27,628	1,029	74.89	87.43
Totals.....	\$56,139	\$532	66.26	\$136,968	\$1,181	85.95	121.99

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.
^c Statements, Controller's Department.

^d State of California, Division of Motor Vehicles.
^e Estimated apportionment of county totals.

Population

Reference to Table 99 indicates that the population of Area 3 has maintained a uniform growth parallel with that of California. Estimates for 1950 and 1955 predict a slightly greater increase. Table 100 gives population figures from 1900 to the present for the cities of the Area. It may be anticipated that an increased population will result in higher airplane passenger potential and more private airplane owners.

TABLE 99
POPULATION OF AREA 3 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period
1930 ^a			
Imperial.....	60,903	1.07	-----
Desert Riverside*.....	20,375	.36	-----
Desert San Bernardino*.....	14,296	.25	-----
Total Area 3.....	95,574	1.68	-----
1935 ^b			
Imperial.....	57,330	.95	—5.87
Desert Riverside*.....	22,897	.38	12.38
Desert San Bernardino*.....	16,479	.27	15.27
Total Area 3.....	96,706	1.60	1.18
1940 ^c			
Imperial.....	59,740	.86	4.20
Desert Riverside*.....	26,381	.38	15.22
Desert San Bernardino*.....	19,333	.28	17.31
Total Area 3.....	105,454	1.52	9.04

TABLE 99—Continued
POPULATION OF AREA 3 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period
1945 ^d			
Imperial.....	55,600	.61	—6.93
Desert Riverside*.....	33,575	.37	27.27
Desert San Bernardino*.....	26,844	.30	38.85
Total Area 3.....	116,019	1.28	10.02
1950 ^e			
Imperial.....	59,750	.60	7.46
Desert Riverside*.....	37,188	.37	10.76
Desert San Bernardino*.....	29,220	.30	8.85
Total Area 3.....	126,158	1.27	8.73
1955 ^f			
Imperial.....	67,950	.61	13.72
Desert Riverside*.....	42,125	.38	13.28
Desert San Bernardino*.....	33,075	.30	13.19
Total Area 3.....	143,150	1.29	13.47

* Apportionment of county totals of Riverside and San Bernardino between Areas 2 and 3.

Source: ^a and ^c United States Census (From Table 34).

^b Midpoint of California Taxpayers' Association Estimate for January 1, 1935, and January 1, 1936.

^d Midpoint of California Taxpayers' Association Estimate for January 1, 1945, and January 1, 1946 (From Table 34).

^e and ^f Estimated projections of the California Reconstruction and Reemployment Commission (From Table 34).

CALIFORNIA AIRPORTS

TABLE 100
POPULATION STATISTICS OF AREA 3
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 3.....		7,546	28,503	64,101	95,574	105,454	†126,310	
Imperial County.....			*13,591	43,453	60,903	59,740	†57,600	
*Brawley.....	1908		881	5,389	10,439	11,718		
*Calxico.....	1908		797	6,223	6,299	5,415		
Calipatria.....	1919			785	1,554	1,799		
*El Centro.....	1908		1,610	5,464	8,434	10,017	11,141	April 17, 1946
Holtville.....	1908		729	1,347	1,758	1,772		
Imperial.....	1904		1,257	1,885	1,943	1,493	1,515	Oct. 23, 1946
Westmorland.....	1934					1,010		
Desert Riverside County.....		4,474	8,674	12,574	20,375	26,381	†37,750	
*Banning.....	1913			1,810	2,752	3,874		
Blythe.....	1916			1,622	1,020	2,355	3,813	April 2, 1946
Coachella.....	1946					1,175		
Indio.....	1930					2,296	2,553	Mar. 25, 1946
*Palm Springs.....	1938					‡ 3,434	7,213	Mar. 14, 1946
Desert San Bernardino County.....		3,072	6,238	8,074	14,296	19,333	†30,960	
*Needles.....	1913			2,807	3,144	3,624	5,015	Aug. 9, 1943

* URBAN—1940.

† Estimate of California Taxpayers' Association.

‡ Classification changed to urban in this interval.

* Imperial County formed from part of San Diego County in 1907.

Unincorporated Places

	Population		Population
Imperial County		Desert San Bernardino County	
Heber.....	632	Adelanto.....	300
Niland.....	627	Amboy.....	125
Palo Verde.....	100	Atolia.....	225
Seeley.....	250	Baker.....	125
Winterhaven.....	100	Barstow.....	2,083
		Daggett.....	150
		El Mirage.....	100
		Hesperia.....	200
Desert Riverside County		Hinkley.....	200
Cabazon.....	175	Linwood.....	225
Cathedral City.....	350	Lucerne Valley.....	325
Desert Garden.....	125	Ludlow.....	150
Garnet.....	125	Newberry.....	200
Idylwild.....	100	Oro Grande.....	375
Mecca.....	525	Red Mountain.....	500
Midland.....	594	Trona.....	1,459
Ripley.....	125	Twentynine Palms.....	719
Thermal.....	400	Victorville.....	2,000
Thousand Palms.....	125	Vidal.....	225
		Yermo.....	300

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

With few exceptions, Area 3 is adequately served by operating airports for private flying. The greater need is observed in the commercial transportation field. This Area ranks first in the State in size; second in air freight potential of agricultural production; yet is

served by only one commercial airline. Western Airlines schedules 2 in and out flights daily to El Centro and 3 to Palm Springs. The various airports, according to county, are listed below:

<i>M-3 Plate Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
IMPERIAL COUNTY			
3-1	El Centro—MC Air Sta.	U. S. Navy Lease	6
3-2	Westmorland—Salton Sea NAAS	U. S. Navy	S-3
3-3	Coyote Wells No. 1 (North) NOLF	U. S. Navy	2
3-4	Coyote Wells No. 2 (South) NOLF	U. S. Navy	1
3-25	Brawley—Municipal	City of Brawley	S-2
3-26	Calexico—Municipal	City of Calexico	2
3-27	Calipatria—Municipal	City of Calipatria	S-4
3-28	Holtville—(NOLF)	County of Imperial	5
3-29	Imperial	County of Imperial	S-2
3-50	Brawley—O'Connell Bros.	Commercial—Private	S-1
3-51	Calexico—Gunterman	Commercial—Private	1
3-52	Imperial—Baxter Bros.	Commercial—Private	S-1
RIVERSIDE COUNTY (Desert)			
3-10	Blythe—Gary (Morton)	U. S. WAA	2
3-11	Desert Center AAFld.	U. S. WAA	4
3-12	Shavers Summit AAFld.	U. S. WAA	5
3-13	Desert Center CAA Site No. 17	U. S. CAA	S-3
3-35	Banning—Municipal	City of Banning	4
3-36	Blythe—(AAFld)	County of Riverside	6
3-37	Palm Springs—(AAFld)	City of Palm Springs	6
3-38	Thermal—(AAFld)	City of Indio	4
3-60	Blythe—Bresson	Commercial—Private	1
3-61	Blythe—Ripley	Commercial—Private	2
3-62	Blythe—Harvey	Commercial—Private	1
3-63	Blythe—Heron	Commercial—Private	S-2
3-64	Cathedral City Airpark	Commercial—Private	2
3-65	Indio	Commercial—Private	2
3-66	LaQuinta	Private	1
3-67	Mecca—Port Mecca	Commercial—Private	S-1
SAN BERNARDINO COUNTY (Desert)			
3-15	Victorville Army Air Field	U. S. Army	6
3-16	Hawes—Aux. No. 1	U. S. WAA	4
3-17	Helendale—Aux. No. 2	U. S. WAA	4
3-18	Rice Army Air Field	U. S. WAA	5
3-19	Bagdad—CAA Site No. 16	U. S. CAA	S-3
3-20	Silver Lake—CAA Site No. 18	U. S. CAA	S-3
3-21	Baker—Silurian Lake Soaring	Public Domain	
(7-5)	Trona (Airport in Inyo County)	U. S. CAA	S-5
3-45	Daggett	County of San Bernardino	5
3-46	Needles—Municipal	City of Needles	5
3-47	Twenty-nine Palms	County of San Bernardino	2
3-70	Adelanto—Mirage Lake	Private	2
3-71	Barstow	Commercial—Private	1
3-72	Barstow Air Ranch	Private	2
3-73	Joshua Tree—"K" Field	Private	S-1
3-74	Needles—Riverview	Commercial—Private	1
3-75	Victorville—66	Commercial—Private	S-2
3-76	Victorville—Hesperia	Commercial—Private	S-1
3-77	West Victorville	Commercial—Private	1
3-78	Yermo-Calico	Commercial—Private	S-4

More complete service has been proposed by Southwest Airways in their application now pending before the Civil Aeronautics Board, which provides stops at

Palm Springs, Indio, Brawley, El Centro and Calexico. Los Angeles is the western terminal and Yuma, Arizona, the eastern terminal of the projected route.

Western Airlines now connects Palm Springs and El Centro with the San Diego and Los Angeles Metropolitan Areas where direct connections are available to all points in the United States; to Canada, Mexico,

Hawaii and the South Pacific. Southwest Airways would provide direct service to the additional cities of Indio, Brawley and Calexico, and connect all points with Yuma, Arizona.

ESTIMATES OF SCHEDULED AIR TRAFFIC

The following table was developed by apportioning the projected 1950 California passenger movements to the population within 25 mile radii of Palm Springs and El Centro. It indicates that Area 3 can expect a commercial air passenger load of 43,139 in 1950 and 63,686 in 1955.

Airline Stop	Annual On and Off Passengers	
	1950	1955
El Centro	28,642	42,115
Palm Springs	14,497	21,571
	43,139	63,686

By converting these totals into daily schedules, it is determined that 16 in and out flights will be required in 1950 and 22 in 1955 to accommodate air passengers alone.

The chief agricultural sections of Area 3 would be greatly benefited by the additional stops proposed at Indio, Brawley and Calexico, which would provide more direct shipment of air freight. Perishable candidates for this type of shipment have been analyzed by quantity produced in 1945 to develop the 1950 and 1955 potential listed below:

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢ †	Tons	Percent @ 5¢ †	Tons
Imperial.....	Beans (Snap and Lima).....	9	90	10	9.0	50	45.0
	Broccoli.....	116	1,392	0		5	69.6
	Cabbage.....	340	4,080	2	81.6	7	285.6
	Cantaloupes.....	4,569	50,259	2	1,005.2	8	4,020.7
	Casabas.....	2	22	0		2	.4
	Celery.....	16	192	0		7	13.4
	Grapes.....	52	884	1	8.8	5	44.2
	Greens (except Spinach).....	22	198	5	9.9	18	35.6
	Honeyball Melons.....	339	3,729	0		2	74.6
	Honeydew Melons.....	1,060	11,660	0		2	233.2
	Lettuce and Romaine.....	12,543	150,516	6	9,031.0	18	27,092.9
	Mixed Melons.....	525	5,775	0		2	115.5
	Mixed Vegetables.....	573	6,876	0		6	412.6
	Peas, Green.....	693	6,930	3	207.9	17	1,178.1
	Persian Melons.....	1	11	0		2	.2
	Tomatoes.....	40	520	23	119.6	43	223.6
	Total.....	20,900	243,134		10,473		33,845
Desert Riverside.....	Grapes.....	473	8,041	1	80.4	5	402.1
	Mixed Melons.....	16	176	0		2	3.5
	Total.....	489	8,217		80		406
Desert San Bernardino..	None						
	Area Total.....	21,389	251,351		10,553		34,251

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945.*
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

The average between projected DC-3 and DC-4 schedules is 17 daily air freight flights in 1950 and 55 in 1955. Combined air freight and passenger service

then will require 33 Commercial flights in 1950 and 77 in 1955.

Translating the above totals into actual air transport schedules, the following estimates are effected:

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

AREA 3

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total		10,553	4,221	28	930	6
Imperial	305	10,473	4,189	27.47	923	6.05
Desert Riverside	265	80	32	.24	7	.05
Desert San Bernardino						
1955 Total		34,251	13,700	90	3,018	20
Imperial	305	33,845	13,538	88.77	2,982	19.55
Desert Riverside	265	406	162	1.22	36	.27
Desert San Bernardino						

Source: * Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

PRIVATE FLYING ESTIMATES

An estimate of private plane ownership for 1950 and 1955, based upon a combination of economic buying power and current private airplane ownership, shows the following distribution:

County	Index	Private Plane Ownership 1950	1955
Imperial	135	155	364
Desert Riverside	117	86	200
Desert San Bernardino	86	51	124
Total		292	688

AIRPORT REQUIREMENTS

Area 3 includes such an enormous expanse that airport recommendations will be taken up by County divisions.

Imperial County

The entire population of Imperial County is concentrated in the irrigated section of the Imperial Valley, reaching from the southern end of the Salton Sea to the Mexican Border. Class 3 airports are recommended for development by 1950 at Brawley and Calexico to adequately serve projected commercial air transport and cargo requirements of this large agricultural area. Private aircraft facilities appear adequate for 1955 projections. The section of El Centro is worthy of special mention. This thriving metropolis of Imperial Valley has been served for many years by the Imperial County Airport adjacent to the town of Imperial and about four miles north of El Centro. The airport is on an excellent site—a Class S-2 facility in need of paving and runway extension to fully meet Class 2 specifications. Further development at this location is contingent upon the resolving of some local considerations, briefly outlined as follows. Just prior to the war, the County of Imperial sponsored the development of a Class 6 airport seven miles west of El Centro. At the

outbreak of hostilities this new field was taken over as a Marine Corps Air Station and is still under lease for that purpose. Its ultimate disposition has not yet been decided. If it is retained as a permanent Marine Base, there is local agitation in favor of the establishment of a new airport suitable for air transport and air cargo operations, west of, and immediately adjacent to the town of El Centro. This development would be in lieu of further expenditure on the present Imperial County Airport, and would be justified on the basis of its proximity to a much larger percentage of the population of lower Imperial Valley. The Marine Corps Air Station is presently used as the Imperial Valley airline terminal, upon an agreement between the airline and the U. S. Navy Department. The proposed new facility would be immediately adjacent to the city rather than seven miles distant and would also increase the availability of the refrigerating and pre-cooling plants, adjoining the site, for future use in air shipment of the many "out of season" agricultural products of Imperial Valley.

Riverside County

A similar concentration of population is noted in the desert portion of Riverside County included in

Area 3. Coachella Valley is the center of commercial date growing and packing; also grapefruit and "out of season" vegetable production. With the completion of the All-American Canal, the irrigable land is expected to triple with a resultant expansion of agricultural output. Indio is the center of this prosperous farming section of the Coachella Valley, and one of its principal shipping points. The airport needs of this community will be adequately served by the Class 4 Airport at Thermal, which the City of Indio contemplates acquiring through the War Surplus disposal program. Idyllwild—there has long been a demand for an airport in the San Jacinto Mountain forest area in the vicinity of Idyllwild for access to this popular all-year recreational area. A suitable site exists in the Hemet Valley approximately six miles to the southeast, in the vicinity of Hemet Reservoir, and development of a Class 1 airport at this location is recommended by 1950 to supply access to this important region, both for recreational purposes and for protection of this extremely valuable watershed. As an example of the importance of this area, it should be pointed out that a million dollar tramway to connect the winter resort area of Mount San Jacinto with Palm Springs has been authorized and is soon to be constructed. The suggested airport would serve to make this section accessible to all of southern California whereas the tramway would serve only Palm Springs residents. Anza-Coahuila—the vil-

lages of Anza and Coahuila are located in a remote section of Riverside County 20 miles southeast of Hemet and approximately the same distance north of Warners Ranch in San Diego County. The broad upland valley in which they are located is not accessible by surface transportation except by a very circuitous route. It comprises the Ramona and Coahuila Indian Reservations and is of growing importance as a farming community and resort-ranch area. Aviation enthusiasts have visited this valley for many years, utilizing a natural field in the vicinity of Anza. While the private flying potential of this section would probably never justify airport development, the desires of outsiders to visit it would warrant a minimum development. Most of this valley is located directly on the natural airway between Los Angeles or Riverside and the cities of the Imperial Valley. An airport in this general location would serve an area of 1,000 square miles not otherwise provided with a safe landing field, and in this connection would be a valuable adjunct to both federal and state forest services. A Class 1 airport development here is recommended by 1955.

San Bernardino County

The thinly populated desert area of San Bernardino County is well served by existing airports and immediate additional requirements are not envisioned.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 3

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Imperial County							
Brawley.....	Brawley	Municipal	S-2	3	C,NS,FP		
Calexico.....	Calexico	Municipal	2	3	C,NS,FP		
Desert Riverside							
Anza.....						1	FS,R
Idyllwild.....				1	R		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

APPENDIX 4

AREA 4—KERN COUNTY

NATURAL CHARACTERISTICS

Area 4 consists solely of Kern County, the third largest in the State.

Geography and Topography

Located in the extreme southern end of the San Joaquin Valley, the Kern County Area borders Kings, Tulare and Inyo Counties on the north; San Bernardino County on the east, Ventura and Los Angeles Counties on the south; and San Luis Obispo County on the west. The Valley is walled in on the west by the Coast Range Mountains, on the east by the Sierra Nevadas and on the south by the Tehachapis. Elevations range from 290 feet in the valley to 8,826 feet at the top of Mount Pinos in the Los Padres National Forest of the Coast Range.

The Kern River, principal stream in the Area, has its source in the Sierra Nevada. It has an annual run-off of 760,000 acre feet and is the main source of water supply for irrigation and hydroelectric power development. Some contribution to the water supply is also made by Poso and Caliente Creeks.

Land Usage

The following is a table of land usage in the Area, from Table 15:

Land used for crops---	259,608 acres
Idle cropland and arable pasture -----	119,407 acres
Farm woodland -----	1,294,509 acres
Forest and all other--	2,161,821 acres
<hr/>	
Total privately owned land-----	3,835,345 acres
National Parks and Forests -----	347,978 acres
Other public lands ---	1,045,477 acres
<hr/>	
Total public land-----	1,393,455 acres

The relatively small amount of land devoted to farms fails to bring out the importance of agriculture in the region's economy.

Climate

Climatic conditions vary widely as do the topographical features just described. In the central valley, Bakersfield is typical with January temperatures ranging between 36 and 58 degrees and July temperatures between 64 and 100 degrees. Rainfall averages 6 inches yearly and occurs mostly in December, January, and February. The small amount of rainfall combined with the warm, dry climate makes irrigation a necessity.

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

The continued development of the Area's major industries depends to a marked degree on an adequate marketing and distribution system. Improved air transportation would open new and wider markets to the local specialties and perishables. Airplane passenger travel should be stimulated by the large population growth in the Area. Since 1930 the rate has been much higher than that in California as a whole, and ranks second only to the San Diego Area. A denser population also offers a better market for private planes.

Agriculture

The central valley, with Bakersfield as the hub, is the center of the agricultural industry. Since 1939 Kern County has ranked fifth among California's counties in farm income. In general, cotton, potatoes, and other field crops take first position, followed by fruits, livestock, and dairy products. The following listing shows the large volume and diversity of carlot shipments:

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Kern
Asparagus-----	41
Beans (Snap and Lima)-----	28
Broccoli-----	78
Cabbage-----	4
Cantaloupes-----	665
Carrots-----	105
Casabas-----	11
Cauliflower-----	130
Celery-----	62
Corn (Green)-----	88
Grapes-----	3,821
Honeydew Melons-----	47
Lemons-----	17
Lettuce and Romaine-----	748
Mixed Deciduous Fruit-----	10
Mixed Vegetables-----	4
Onions-----	654
Oranges and Satsumas-----	412
Peaches-----	40

OUTBOUND CARLOADS—Continued

Commodity	Kern
Pears.....	38
Peas (Green).....	676
Peppers.....	4
Plums and Fresh Prunes.....	529
Potatoes (White or Irish).....	22,407
Spinach.....	1
Tomatoes.....	879
Turnips and Rutabagas.....	13
Watermelons.....	283
Total.....	31,795

Source: *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

Agricultural perishables will require an expanded air freight service. An estimated potential of such air freight shipments will be given later.

The startling increase of cash farm income in 1945 compared with 1940 is illustrated by the following totals:

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			Percent Change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	\$8,343,000	-----	100.00	\$20,780,900	-----	100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Kern.....	27,000	4.01	.32	73,608	4.12	.35	172.62

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States, 1946*.

Mineral Production

The value of mineral products ranks first in the financial structure of Area 4 and occupies second position among the Areas of the State. This one County produced almost 27 percent of California's mineral wealth in 1945, as shown in the accompanying table of comparative values:

Petroleum accounted for 91 percent of the 1944 values, followed by natural gas, clay, gypsum, and miscellaneous stone. Remaining values include gold, antimony, bentonite, tungsten, salt, and cement.

Airplane service will facilitate prospecting for oil and make possible air express shipments of machine parts.

Timber Production

Kern County is sparsely timbered and lumber production represents only a small part of its industrial economy. It is estimated that in 1945 there was a lumber potential of 806,000,000 board feet.¹ About 89 percent of this was available for cutting and 6,625,000 board feet were cut in 1945.² This was less than 1 percent of the State total. (Table 23.)

¹ California Forest and Range Experiment Station, Forest Survey Release No. 4, March 1, 1946.

² Agriculture Forest Service, California Forest and Range Experiment Station, *Forest Research Notes*, No. 50, Sept. 12, 1946.

Manufacturing

The manufacturing industry ranks third in economic importance in Area 4. It consists principally of food processing of local farm produce and various refined petroleum products. In 1939 the value of manufactured products amounted to \$31,253,635.¹

¹ United States Census of Manufacturers.

VALUE OF MINERAL PRODUCTION IN AREA 4

	Mineral Production	Percent of California	Percent of U. S.	Percent Change from Preceding Period
1930 Kern.....	\$42,987,977	11.76	.90	-----
1935 Kern.....	46,944,409	17.82	1.29	9.20
1940 Kern.....	62,855,732	18.33	1.13	33.89
1945 Kern.....	126,716,070	26.75	-----	101.60

Tourist and Travel Industry

Kern County is separated from the Southern California pleasure belt by the Tehachapi Mountains and lies south of the gateways to Yosemite National Park. Until recently, it had achieved little prominence as a recreational center. During the last few years, however, increased interest has been evidenced in the county's winter sports, particularly in the Shirley Meadows and Mount Pinos areas. Camping sites and recreational attractions suitable for development are located in the Breckenridge, Greenhorn and Frazier Mountain Parks.

Distribution and Transportation

The San Joaquin Valley serves as a natural channel for transportation of every type and at the southern extremity, Area 4 becomes a focal point for this flow of traffic. It is served by the main lines of the Santa Fe and Southern Pacific Railroads, numerous bus and truck lines, and the United Air Lines. United States Highway No. 6 traverses the eastern section north to south, connecting Los Angeles with Mojave and Lone Pine. In the west central region United States High-

way No. 99 passes through Bakersfield to connect Los Angeles with Fresno. United States Highway No. 399 passing through Maricopa and Taft, connects Highway No. 99 and Highway No. 101. Highway No. 466, traversing the county from northwest to southeast, connects the Coast Highway with Highway 99 at Famoso, intersects Highway 6 at Mojave and continues on to Barstow after intersecting Highway 395. In addition, numerous State Highways serve to link the above routes together into a well integrated transportation system radiating from Bakersfield.

Indices of Purchasing Power

An examination of indices given in Table 101 reveals that bank deposits in 1944 were almost three times the amount reported for 1941; per capita assessed valuation in 1945 was over 276 percent of the comparable figure for the State, placing Area 4 in top position among the Areas of California; and per capita retail sales in 1945 were 26 percent greater than the State average.

These factors present a valid basis for financing needed airport expansion and development.

TABLE 101
INDICES OF PURCHASING POWER FOR AREA 4
Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Kern.....	\$221,391,937	\$2,681	149.19	-----	\$223,186,905	\$2,468	226.63	—7.95
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Kern.....	\$284,195,485	\$2,103	203.58	—14.79	\$350,601,630	\$3,877	276.14	84.36

Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Kern.....	36,082	.44	122.22	-----	38,689	.43	122.86	—2.27
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Kern.....	56,903	.42	105.00	—2.33	58,299	.33	106.45	—21.43

CALIFORNIA AIRPORTS

TABLE 101—Continued
 INDICES OF PURCHASING POWER FOR AREA 4
 Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Kern.....	\$89,729	\$664	82.69	\$217,145	\$1,213	88.28	82.68

Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
 (In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Kern.....	\$33,387	.79	\$46,073	.84	\$69,381	.97	\$91,006	1.05

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Kern.....	\$38,490	\$466	82.33	-----	\$40,698	\$450	117.49	—34.34
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Kern.....	\$58,972	\$436	94.58	—3.11	\$125,887	\$932	126.12	113.76

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

TABLE 102
 POPULATION OF AREA 4 BY FIVE-YEAR PERIODS
 1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930 ^a Kern.....	82,570	1.46	-----	1945 ^d Kern.....	179,000	1.97	32.47
1935 ^b Kern.....	90,430	1.49	9.52	1950 ^e Kern.....	197,400	1.99	6.37
1940 ^c Kern.....	135,124	1.96	49.42	1955 ^f Kern.....	222,700	2.00	12.82

Source: Same as Table 93, Page 244.

Population

Reference to Table 102 discloses a rapid growth in population but fails to show the degree of increase in this Area. From 1930 to 1945 California's population expanded 160 percent but Kern County shows an increase of 217 percent. Table 103 gives population

figures from 1900 to the present for the cities of the Area. A rapidly expanding population can only result in more airplane passengers and more private airplane owners. This factor, combined with the unusual air freight potential presented by the agricultural industry, serves as a basis for the succeeding aeronautical analysis.

TABLE 103
POPULATION STATISTICS OF AREA 4
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 4.....		16,480	37,715	54,843	82,570	135,124	†200,000	
Kern County.....		16,480	37,715	54,843	82,570	135,124	†200,000	
*Bakersfield.....	1898	4,836	12,727	18,638	26,015	29,252	32,807	May 8, 1946
*Delano.....	1915			805	2,632	4,573	6,630	Aug. 23, 1946
Maricopa.....	1911			1,121	1,071	670		
McKittrick.....				207	Annexed to Taft			
Shafter.....	1938					1,258		
*Taft.....	1910			3,317	3,442	3,205		
Tehachapi.....	1909		385	458	736	1,264	1,512	Oct. 31, 1946
Wasco.....	1945					5,000		

* URBAN—1940.

† Estimate of California Taxpayers' Association.

Unincorporated Places

Kern County	Population	Kern County—Continued	Population
Arvin.....	4,042	Magunden.....	300
Boron.....	890	McFarland.....	2,120
Buttonwillow.....	685	McKittrick.....	200
Caliente.....	140	Mojave.....	1,241
Derby Acres.....	315	Monolith.....	215
Famoso.....	150	Mountain View.....	225
Fellows.....	530	Muroc.....	425
Ford City.....	3,144	Oil Center.....	600
Frazier Park.....	175	Oildale.....	4,492
Greeley.....	125	Old River.....	240
Green Acres.....	435	Panama.....	100
Inyokern.....	250	Randsburg.....	630
Isabella.....	250	Reward.....	160
Johannesburg.....	160	Riverview (Part of Bakersfield).....	2,859
Johnsondale.....	250	Rosamond.....	490
Keene.....	240	Rosedale.....	250
Kernville.....	350	South Taft.....	2,179
Lamont.....	1,200	Taft Heights.....	1,742
Lebec.....	250	Tupman.....	150
Lerdo.....	3,500	Valley Acres.....	240
Lost Hills.....	200	Weed Patch.....	1,040
		Weldon.....	200

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

Area 4 has numerous small airports to accommodate private aircraft, but many are sub-standard when judged by CAA physical criteria. At the same time a dearth of operating commercial facilities is apparent

in the industrial and intensive agricultural region. The Area's existing airports by location, type of operation and classification are as follows:

<i>Plate M-4 Map Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
KERN COUNTY			
4-1	Bakersfield—Minter Army Air Field	U. S. Army	3
4-2	Pond—Minter Aux. No. 2	U. S. WAA	2
4-3	Famoso—Minter Aux. No. 3	U. S. WAA	2
4-4	Dunlap—Minter Aux. No. 4 (Jasmine)	U. S. WAA	2
4-5	Semi-Tropic—Minter Aux. No. 5	U. S. WAA	2
4-6	Poso—Minter Aux. No. 6	U. S. WAA	2
4-7	Inyokern—Armitage Field	U. S. Navy	6
4-8	Inyokern—Harvey Naval Air Field	U. S. Navy Lease	6
4-9	Mojave—Marine Corps Air Sta.	U. S. Navy Lease	4
4-10	Muroc—Muroc Army Air Field	U. S. Army	6
4-11	Muroc—Muroc Army Flt. Test	U. S. Army	9
4-12	Taft—Gardner Army Air Field	U. S. WAA	5
4-13	Parker—Gardner Aux. No. 1	U. S. WAA	2
4-14	Kern—Gardner Aux. No. 2	U. S. WAA	4
4-15	Allen—Gardner Aux. No. 3	U. S. WAA	2
4-25	Bakersfield Municipal	County of Kern	5
4-26	Bakersfield No. 2	County of Kern	1
4-27	Buttonwillow	County of Kern	S-1
4-28	Delano	County of Kern	5
4-29	Inyokern	(Lease to USN-Harvey NAS)	
4-30	Kernville	County of Kern	S-1
4-31	Lebec	County of Kern	S-1
4-32	Lost Hills	County of Kern	4
4-33	Maricopa	County of Kern	1
4-34	Mojave	(Under Lease to USN-See Mojave MCAS)	
4-35	McKittrick	County of Kern	1
4-36	Randsburg	County of Kern	S-1
4-37	Shafter	County of Kern	1
4-38	Taft	County of Kern	2
4-39	Taft No. 2—Conner's	County of Kern	2
4-40	Tehachapi	County of Kern	3
4-41	Wasco	County of Kern	S-2
4-50	Bakersfield—Rudnick Air Park	Commercial-Private	2
4-51	Bakersfield—La Cresta	Commercial-Private	3
4-52	Bakersfield—Pumpkin Center	Commercial-Private	1
4-53	Bakersfield—Bowhay Ranch	Private	1
4-54	Bodfish—Seovern's Hot Springs	Private	1
4-55	Boron—Boron	Private	1
4-56	Inyokern—Drummond Hospital	Private	S-1
4-57	Inyokern—Helm Field	Private	S-1
4-58	Inyokern—Ridgecrest	Commercial-Private	2
4-59	Rosamond—Rancho Oro Verde	Private	S-2
4-60	Rosamond—White Oak Lodge	Private	S-1
4-61	Weed Patch—Weed Patch	Private	S-1
4-62	Weed Patch—Sunset School	Private	S-1
4-63	Wheeler Ridge	Private	S-1
4-64	Taft—Valley Acres	Private	S-1

ESTIMATES OF SCHEDULED AIR TRAFFIC

At present, Area 4 is served only by United Air Lines, with Bakersfield, its operational point. There are seven scheduled in and out flights daily which connect this Area with Los Angeles in the south and with Fresno to the north. This service may be augmented soon by Southwest Airway's proposal to inaugurate feederline service to the communities of Taft, Bakers-

field and Delano on a northerly valley route and to Mojave on a parallel route to Reno, Nevada via Death Valley. Certification of both projected routes has been requested of the Civil Aeronautics Board.

More frequent intermediate stops would not only relieve congestion at Bakersfield, particularly in the handling of air freight, but would more closely inte-

grate air transport in the Area as a whole. Also, increased schedules would promote direct shipments to the Los Angeles and San Francisco metropolitan consumers and to the terminals which provide connections with trans-Pacific, Canadian and Mexican flights and with all points in the United States.

Comparative figures for 1945 and 1946 given below reveal an amazing growth of air passenger activity at Bakersfield airport:

Year	Passengers On and Off	No. of Schedules	Passengers Per Schedule
1945 -----	3,018	1,377	2.2
July -----	198	124	1.6
1946 -----	12,927	2,230	5.8
July -----	1,348	217	6.2

Area 4 will require approximately nine in and out passenger flights per day in 1950 and 12 per day in 1955. This is determined by reducing to plane loads the following estimate of passenger potential:

Air Line Stop	Passengers Annual On and Off	
	1950	1955
Bakersfield -----	16,266	23,626
Mojave -----	1,060	1,540
Total -----	17,326	25,166

The extreme diversity and volume of agricultural perishables produced in this region offers a correspondingly high candidacy for air freight shipments, as the Table shown below reveals:

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Kern-----	Asparagus-----	41	492	15	73.8	28	137.8
	Beans (Snap and Lima)-----	28	280	10	28.0	50	140.0
	Broccoli-----	78	936	0	-----	5	46.8
	Cabbage-----	4	48	2	1.0	7	3.4
	Cantaloupes-----	665	7,315	2	146.3	8	585.2
	Casabas-----	11	121	0	-----	2	2.4
	Cauliflower-----	130	1,560	0	-----	6	93.6
	Celery-----	62	744	0	-----	7	52.1
	Corn, Green-----	88	1,056	14	147.8	39	411.8
	Grapes-----	3,821	64,957	1	649.6	5	3,247.9
	Honeydew Melons-----	47	517	0	-----	2	10.3
	Lettuce and Romaine-----	748	8,976	6	538.6	18	1,615.7
	Mixed Deciduous Fruit-----	10	140	2	2.8	8	11.2
	Mixed Vegetables-----	4	48	0	-----	6	2.9
	Peaches-----	40	480	7	33.6	23	110.4
	Pears-----	38	570	0	-----	2	11.4
	Peas, Green-----	676	6,760	3	202.8	17	1,149.2
	Peppers-----	4	48	5	2.4	14	6.7
	Plums and Fresh Prunes-----	529	7,935	1	79.4	13	1,031.6
	Spinach-----	1	9	4	.4	15	1.4
	Tomatoes-----	879	11,427	23	2,628.2	43	4,913.6
	Turnips and Rutabagas-----	13	247	0	-----	14	34.6
	Total-----	7,917	114,666	-----	6,535	-----	13,620
	Area Total-----	7,917	114,666	-----	6,535	-----	13,620

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945.*
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

Area 4

	Days in Normal Growing Season	Perishables Likely Air Freight Candidates (in tons)	No. of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	No. of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total -----	277	6,535	2,614	19	576	4
1955 Total -----	277	13,620	5,448	39	1,200	9

Source: Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

Information contained in the above table has been consolidated and reduced to actual transport schedules with the following results:

The average of projected DC-3 and DC-4 schedules shown above indicates that air freight shipments will

require 12 schedules per day in 1950 and 24 per day in 1955. The combined air freight and passenger estimates signify that 21 commercial schedules will be requisite in 1950 and 36 in 1955.

PRIVATE FLYING ESTIMATES

Incorporating an index of economic buying potential with private plane per capita ownership, produces the following estimate for private aircraft ownership in 1950 and 1955:

<i>County</i>	<i>Index</i>	<i>Private Plane Ownership</i>	
		<i>1950</i>	<i>1955</i>
Kern	103	392	915

Private plane ownership has been distributed to judicial townships by combining population and average unit rental to develop the following Table:

KERN COUNTY

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
1	.86	3	8
2	5.88	23	54
3	34.28	134	314

KERN COUNTY—Continued

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
4	.86	3	8
5	.65	3	6
6	16.02	63	147
7	8.85	35	81
8	1.67	7	15
9	4.58	18	42
10	.24	1	2
11	1.80	7	16
12	.66	2	6
13	.21	1	2
14	.07	-	1
15	18.26	72	167
16	3.87	15	35
17	1.24	5	11

AIRPORT REQUIREMENTS

Bakersfield

Bakersfield, situated in the central valley, 120 surface miles northwest of Los Angeles, and 293 southeast of San Francisco, is the county seat of Kern County. There is a resident population of 32,807 as of January, 1947. The county has a population of 192,000 as of July 1st, 1946, and Bakersfield is a trading center for approximately half the county with a large volume of industrial, agricultural, financial and subsidiary business. The community too, is the center of the greatest oil producing county in the United States. This city is presently served by five airports—two Class 1 (Pumpkin Center and Kern County #2), one Class 2 (Bakersfield), one Class 3 (LaCresta) and one Class 5 (Bakersfield, Kern County). Approximately 150 aircraft are based in the Bakersfield sector. The airport facilities in the locality are considered well distributed to provide adequate coverage to Bakersfield and environs, for the period under study, since the combined capacity of listed airports exceeds by a considerable margin, the 1955 Private Plane Potential for townships 2, 3, 6, part of 9, and a portion of 15, which lie within the service areas of these fields.

Buttonwillow

This community is located 25 miles due west of Bakersfield on State Highway 178, the highway link connecting Bakersfield with the coastal cities. The 1947 National Airport Plan contemplates improvement of the present county owned S-1 facility at this location to

standard Class 1. This is the only airport in the immediate section, the nearest being Bakersfield. The Private Plane Potential for the region served by this airport is approximately 10 for 1950 and 25 for 1955, which will justify improvement to full Class 1 by 1950, which improvement is recommended in this report.

Kernville

Kernville is situated approximately 40 air miles northeast of Bakersfield and is presently served by a county owned Class S-1 airport. Since the nearest airport, Inyokern, is at present under lease to the United States Navy, improvement of the Kernville facility to full standard Class 1 by 1950 is recommended to complete the adequate airport coverage pattern of Kern County, and serve all needs of non-scheduled aviation in the section.

Randsburg

This community is approximately 80 air miles due east of Bakersfield and 50 miles southeast of Kernville, served by a County owned S-1 improvement which is recommended to full Class 1 standards by 1950 for the same reason as the Kernville recommendation—to complete the county's airport pattern and serve non-scheduled aviation.

Lebec

This Class S-1 airport is located 45 air miles south of Bakersfield on the ridge route. It has served the emer-

gency needs of non-scheduled aviation many times in the past, located as it is, directly on the main airway from Los Angeles to all points north. Development to full Class 1 CAA specifications is considered an immediate necessity in the interest of safety and convenience for non-scheduled aviation.

Delano

Delano is in the extreme north central section of Kern County, thirty-one highway miles northwest of Bakersfield and is the site of a county-owned Class 5 airport, which together with the county owned Class 4 facility at Lost Hills, and county owned Class 1 at McKittrick adequately serves the airport needs of the northern and western sectors of the County.

Taft-Maricopa

This is the southwest sector of Kern County, one of the oil producing sections. Its airport needs are served by three county-owned airports—Taft, Class 2, less than a mile east of town; Taft #2, Class 2, approximately 7 miles east-southeast of town and Maricopa, Class 1, approximately 7 miles southeast of Taft. The 1947 National Airport Plan considers improvement of Taft, Class 2, CAA Site 2338, less than a mile from town, to a Class 3 facility. This development is recommended in this report for accomplishment by 1950. Taft is headquarters for oil operators in the Midway, Buena Vista Hills and Sunset oil fields comprising 43,196 proven acres of oil producing land. Two-thirds of all the oil producing area of California is adjacent to the Taft district. There are also several refineries and oil well supply companies located here. Taft is designated as a stop on Southwest Airways' projected route connecting Bakersfield with Los Angeles, which stresses the need for a Class 3 facility, minimum requirements for routine feeder line operation, at this location.

Arvin

This is a relatively new town, unincorporated, with a population of 4,042, approximately 25 miles airline southeast of Bakersfield. It is a fast growing agricultural community with high aviation interest and cargo possibilities of agricultural perishables are considered excellent. It is believed that prior to 1955 the air freight potential will be resolved to the point where it definitely can be determined what the airport requirements will be. Meanwhile Arvin should have a small airport designed for future expansion to Class 3 standards. A Class 1 airport at this location is recommended for 1950 and development to Class 3 by 1955. This is the only recommendation for development of a new airport site for Area 4, made in this study.

Other Locations

The 1947 National Airport Plan and Program contemplates improvement of *Shafter*, eighteen miles northwest of Bakersfield, a county-owned Class 1 to standard specifications; *Tehachapi*, a county owned Class 3 facility fifty miles southeast of Bakersfield is included in the National Airport Plan and Program for improvements to meet full Class 3 standards, and *Wasco*, a county owned facility, Class S-2, twenty-two miles northwest of Bakersfield is likewise included for improvements to full Class 1. The improvement of these three fields is believed desirable, first, because it is felt that all public owned facilities, wherever possible, should be brought to full Civil Aeronautics Administration specifications for their respective Classes. Further, Tehachapi serves as a connecting link in the Kern County airport pattern—Bakersfield to Kernville to Randsburg to Tehachapi to Bakersfield, and Wasco and Shafter fit into the pattern—Bakersfield, Buttonwillow, Shafter, Wasco, and Delano, to provide adequately for the airport needs of non-scheduled aviation, both business and pleasure, in Area 4.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 4

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Kern County							
Buttonwillow		County	S-1	1	NS		
Kernville		County	S-1	1	NS		
Randsburg		County	S-1	1	NS		
Lebec		County	S-1	1	NS		
Taft		County	2	3	NS,FP		
Arvin				1	NS	3	NS,C

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

APPENDIX 5

AREA 5—MID-COASTAL COUNTIES

NATURAL CHARACTERISTICS

Area 5, fifth in size of the aviation areas in California, includes Santa Cruz, Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura Counties.

Geography and Topography

This rugged, mid-coastal Area is bounded on the north by San Mateo and Santa Clara, and on the east by Merced, Fresno, Kings, Kern, and Los Angeles Counties. Most of the surface is covered by ridges and spurs of the southern coast range. Lying between the tangled maze of wooded mountains are numerous fertile valleys which widen out at spots to alluvial plains of considerable agricultural value. Elevations range within a short distance from sea level to peaks as high as 8,826 feet in Ventura County and 6,828 feet in Santa Barbara County.

A number of rivers and streams—the San Lorenzo, Pajaro, Salinas, Carmel, San Benito, Santa Maria, Santa Ynez, and Santa Clara—have forced a way through the coastal range to the sea. The principal agricultural communities of the Area lie along their banks.

Climate

The climate of the Area, because of its proximity to the Pacific Ocean, is mild and coastal. Fog is more common than in the great interior valleys and the western slopes of the coast range receive more rainfall. As a result, the mountains are thickly covered with forests and brush and tourist resorts abound. In the Salinas

Valley the temperature ranges in January from 39 to 60 degrees and in July from 52 to 71 degrees. Because of ocean currents, Santa Barbara and Ventura are slightly warmer; some of the mountain resorts are considerably cooler. The average rainfall varies from 13 inches in San Benito at Hollister to 27 inches in Santa Cruz on the coast.

The Area's benign climate has favored the development of certain agricultural specialties, such as lettuce in the Salinas Valley, and made the coastal and mountain resorts famous throughout the United States.

Land Usage

Over half of the 8,375,680 acres of land in the Mid-Coastal Aviation Area is in farms and a considerable portion of the remainder is devoted to parks and national forests, and recreational centers of interest to tourists. A tabulation of the land usage of the Area (from Table 15) follows:

Land in Farms-----	4,860,518 acres
Land in Crops-----	807,402 acres
Idle Cropland -----	645,216 acres
Farm Woodland -----	3,407,900 acres
In Forest and All Other---	927,084 acres
Total Privately Owned-----	5,787,602 acres
Parks and National Forests	1,705,513 acres
Other Public Land-----	882,565 acres
Total Publicly Owned -----	2,588,078 acres
Total Land in Area 5-----	8,375,680 acres

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

The most important industries in the Area are agriculture, fishing, and tourist trade. Certain forms of manufacturing, however, and mining and timber production contribute a substantial share to the total wealth. The population has been increasing at almost exactly the same rate as the State as a whole, and it is estimated that this rate of increase will continue through 1955. Because of its Mediterranean climate the Area has attracted many wealthy, retired persons who have built handsome villas along the picturesque coast. For this Mid-coastal Aviation area, aeronautical devel-

opment will be mainly influenced by air freight requirements for agricultural perishables and air passenger facilities for tourists and residents.

Agriculture

Agriculture is the principal source of wealth in the Area. The long growing season and fertile land of the agricultural valleys have eventuated in a long list of local specialties. Ranked according to monetary value the five chief agricultural products of each county follows (see Table 24):

Monterey-----	(1) Lettuce
San Benito-----	Beef
San Luis Obispo-----	Beef
Santa Barbara -----	Beef
Santa Cruz -----	Apples
Ventura-----	Lemons

(2) Sugar Beets
Sugar Beets
Wheat
Lemons
Lettuce
Oranges

(3) Beans
Apricots
Dairy
Dairy
Eggs
Beans

(4) Dairy
Prunes
Peas
Sugar Beets
Berries
Walnuts

(5) Carrots
Tomatoes
Eggs
Lettuce
Nursery
Beef

In 1940 Monterey led the State in the value of artichokes produced, Santa Barbara led in the value of cauliflower, Santa Cruz in apples, and Ventura in beans, lemons, and walnuts.

The number of carloads of agricultural produce shipped from the Area in 1945 shows the preponderant importance of lettuce, one of the best air freight potential candidates:

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Monterey	San Benito	San Luis Obispo	Santa Barbara	Santa Cruz	Ventura
Apples.....	117				1,024	
Apples (Dried).....	4				48	
Apricots.....				4		
Beans (Snap and Lima).....				24		4
Beets (Edible).....	4					
Broccoli.....	355			182	10	
Cabbage.....	165	8		273	42	5
Carrots.....	4,816	131	2	783	13	681
Cauliflower.....	35	56	182	3,227	17	137
Celery.....	1,318	76	242	954	97	67
Grapefruit.....						115
Greens (Except Spinach).....					202	
Lemons.....				2,214		4,891
Lettuce and Romaine.....	25,686	1,475	19	1,137	4,120	97
Mixed Citrus Fruit.....						8
Mixed Deciduous Fruit.....	1				2	
Mixed Vegetables.....	4,540	112	168	3,357	699	61
Onions.....	706	1				
Oranges and Satsumas.....				33		6,149
Pears.....					31	
Peas, Green.....	36	34	6	36		
Peppers.....	1			7		
Plums and Fresh Prunes.....	3				19	
Potatoes (White or Irish).....	1		14	241		
Prunes (Dried).....		61				
Spinach.....	5			1		
Tomatoes.....	322			848	204	171
Turnips and Rutabagas.....				1		
Totals.....	38,115	1,954	633	13,322	6,528	12,386
Grand total.....						72,938

Source: California Carlot Shipments, Fruits and Vegetables, 1945, California Crop and Livestock Reporting Service and Federal-State Market News Service.

GROSS CASH FARM INCOME—1940 AND 1945 (From Table 40)

(In thousands of dollars)

	1940			1945			Percent Increase 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Monterey.....	22,200	3.30	.27	53,462	2.99	.26	140.81
San Benito.....	5,800	.86	.07	14,516	.81	.07	150.27
San Luis Obispo.....	9,700	1.44	.12	26,578	1.49	.13	174.00
Santa Barbara.....	14,400	2.14	.17	35,778	2.00	.17	148.46
Santa Cruz.....	6,300	.94	.07	16,970	.95	.08	169.37
Ventura.....	22,500	3.34	.27	52,338	2.93	.25	132.61
Total Area 5.....	\$80,900	12.02	.97	\$199,642	11.17	.96	146.77

Source: California Crop and Livestock Reporting Service. United States totals from Statistical Abstract of the United States, 1946.

In 1945 the area ranked fifth among the aviation areas of the State in gross farm income. The relative position of the various counties and comparisons with California and United States totals are given in the foregoing table.

Some of the first experiments in the air transportation of agricultural perishables were made in this area and a considerable volume of such produce—especially lettuce—has already been shipped to Eastern markets by air. Estimates of the potential volume of such shipments will be given later. As regards air freight, agriculture will provide the principal shipments for the area.

Mineral Production

Area 5 is fifth among the aviation areas in value of mineral production. About half of the oil produced in the State comes from local wells. Chromite, diatomite, dolomite, magnesite, quicksilver, silica, cement and building-stone are also found. A table of the monetary value of mineral production follows:

VALUE OF MINERAL PRODUCTION IN AREA 5

	Mineral Production	Percent of California	Percent of U. S.	Percent Change from Preceding Period
1930				
Monterey.....	\$452,974	.12	.01	-----
San Benito.....	1,389,490	.38	.03	-----
San Luis Obispo..	248,115	.07	-----	-----
Santa Barbara....	24,368,374	6.66	.51	-----
Santa Cruz.....	2,361,954	.65	.05	-----
Ventura.....	31,952,052	8.74	.67	-----
Totals.....	\$60,772,959	16.62	1.27	-----
1935				
Monterey.....	\$132,689	.05	-----	—70.71
San Benito.....	242,254	.09	.01	—82.57
San Luis Obispo..	265,443	.10	.01	6.98
Santa Barbara....	8,680,173	3.30	.24	—64.38
Santa Cruz.....	1,533,433	.58	.04	—35.08
Ventura.....	14,236,946	5.40	.39	—55.44
Totals.....	\$25,090,938	9.52	.69	—58.71
1940				
Monterey.....	\$307,177	.09	.01	131.50
San Benito.....	1,401,496	.41	.02	478.52
San Luis Obispo..	491,329	.14	.01	85.10
Santa Barbara....	8,045,351	2.35	.14	—7.31
Santa Cruz.....	2,779,306	.81	.05	81.25
Ventura.....	20,647,881	6.02	.37	45.03
Totals.....	\$33,672,540	9.82	.60	34.20
1945				
Monterey.....	\$3,018,280	.64	-----	882.59
San Benito.....	1,949,386	.41	-----	39.09
San Luis Obispo..	497,923	.11	-----	1.33
Santa Barbara....	22,643,580	4.78	-----	181.45
Santa Cruz.....	2,015,407	.43	-----	—27.49
Ventura.....	29,352,740	6.20	-----	42.16
Totals.....	\$59,477,316	12.56	-----	76.63

Source: *Minerals Yearbook Review of 1940, California Division of Mines Bulletins*, California State Chamber of Commerce.

The mining industry of the Area will be interested in airport facilities for rapid transportation of machine parts and samples, for prospecting and surveying, and for the handling of private planes belonging to the mining personnel.

Tourist and Travel Industry

The area has many attractions for tourists—warm beaches covered with white sand, national forests and monuments, a large number of State parks. Approximately one-fifth of the total surface is covered by National Forests. Los Padres National Forest spreads through four of the counties. In 1946 there were 15,888 visitors to Pinnacles National Monument. A tabulation of the volume of visitors to the State parks in 1946 follows:

VISITORS TO CALIFORNIA STATE PARKS—1946

(From Table 18)

AREA 5

Area 5	Number of Visitors
Monterey	
First Theatre.....	40,799
Fremont Peak.....	12,500
House of Gold.....	5,000
Junipero Serra Landing Place.....	15,000
Old Custom House.....	55,597
Pfeiffer Big Sur.....	86,232
Point Lobos Reserve.....	49,452
Stevenson House.....	3,000
	267,580
San Benito	
San Juan Bautista Monument.....	16,935
San Luis Obispo	
Cayucos Beach.....	6,500
Morro Bay Park.....	98,650
Morro Strand.....	9,500
Pismo Beach.....	9,500
San Simeon Creek Beach.....	1,000
	125,150
Santa Barbara	
Carpinteria Beach.....	91,875
La Purisima Mission.....	13,246
	105,121
Santa Cruz	
Big Basin Redwoods.....	427,610
Natural Bridges Beach.....	15,000
New Brighton Beach.....	18,000
Seacliff Beach.....	223,425
Sunset Beach.....	12,000
	696,035
Total.....	1,210,821

Source: California Department of Natural Resources, Division of Beaches and Parks.

The area has long been a favorite vacation choice for Californians. With the development of air passenger service and increased use of private airplanes, visitors from the entire United States and abroad will find time available to visit this Area, famous for its beauty and climate.

Fishing Industry

The coastal waters of Monterey and Santa Barbara are famous for their yield of Pacific Ocean fish.

In 1943—462,196,747 pounds of a wide variety of fish, crustaceans, and mollusks—nearly 41 percent of the State total—were caught in this locale.¹ Hitherto, most of this catch has been canned or consumed locally. Developing air freight will afford an opportunity for new markets for the fresh product in the mid-west and east. Aircraft may also be used to a certain extent in locating schools of fish for both sportsmen and commercial fleets.

Timber Production

Much of the western slopes of the Southern coast range is covered by forests. In the entire area the lumber stands equal 1,640,000,000 board feet.² About one-quarter of this is available for commercial cutting. In 1945 mills were active only in Santa Cruz County where 13,779,000 board feet were cut.³

Adequate airport facilities will be needed to accommodate tourists and meet the requirements of the Federal and State forestry services. These services have requested facilities as follows:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 5 By Counties

Monterey County

1. The California Division of Forestry will use Moss Landing, Salinas, Marina, Del Monte, Jolon and King City Airports in their present condition. The United States Forest Service will use Monterey and King City Airports in their existing condition.

San Benito County

1. Class 1 at Llanda—State Division of Forestry
 2. Class 1 at San Benito—State Division of Forestry
 3. Class 1 at Idria—State Division of Forestry
- The State Division of Forestry will use Hollister and Tres Pinos Fields in their present condition.

San Luis Obispo County

1. Class 1 at Sycamore Canyon—State Division of Forestry
 2. Class 1 at La Panza—State Division of Forestry
- The State Division of Forestry will use San Simeon, Cambria, Estrella, Paso Robles, San Luis Obispo, Soda Lake and a field five miles north of the Cuyama River at the 120th meridian, in their existing condition. The United States Forest Service will use San Luis Obispo Airport in its present condition.

Santa Barbara County

1. Class 2 at Cuyama—United States Forest Service
 2. Class 2 at Los Alamos—United States Forest Service
 3. Class 2 at Santa Ynez—United States Forest Service
- The State Division of Forestry will use Santa Maria and Betteravia Airports in their present condition. The United States Forest Service will use Santa Barbara Field in its existing condition.

Santa Cruz County

The State Division of Forestry will use Boulder Creek, Ben Lomond, Felton, Soquel and Watsonville Fields in their present condition.

Ventura County

1. Class 2 at Santa Paula—United States Forest Service.

Manufacturing

Fish canning and processing, sugar beet refining, quicksilver production, petroleum refining, and the preparation of cement are the most important manufacturing industries of the area. Monterey County has the largest beet sugar refinery in the world. An examination of the following table of value of manufacturers in 1929 and 1939 shows that although the total value for California during this period decreased, the value of manufacturers for the area increased.

VALUE OF MANUFACTURES IN AREA 5

	1929		1939	
	Value of Manufacturing	Percent of California	Value of Manufacturing	Percent of California
California.....	\$2,950,053,451	100.00	\$2,798,179,523	100.00
Monterey.....	20,858,855	.71	27,136,030	.97
San Benito.....	2,758,007	.09	649,361	.02
San Luis Obispo..	6,348,380	.22	1,849,952	.07
Santa Barbara...	4,315,217	.15	8,712,343	.31
Santa Cruz.....	8,374,184	.28	7,958,763	.29
Ventura.....	11,703,553	.39	10,386,007	.37
	\$54,358,196	1.84	\$56,692,456	2.03

Source: United States Census of Manufacturers.

Distribution and Transportation

The main coast line of the Southern Pacific Railway Company follows the Salinas Valley and then crosses Santa Barbara and Ventura Counties to Los Angeles. Branch lines of this company in Monterey, San Benito, Santa Cruz, and Ventura Counties, in connection with the Santa Maria Valley Railroad in Santa Barbara County, link all the main population centers.

Highway No. 101 with parallel and joining branch roads serves the entire area and links it with metropolitan cities to the north and south and with the San Joaquin Valley to the east. Excellent bus service gives the traveller choice of rail or bus service. Trucks haul much of the agricultural produce and petroleum to points out of the area. When air freight is further advanced, the highway system should prove adequate for concentrating full plane loads at selected packing and loading points.

Present airplane service in the area will be taken up later.

¹ *Thirty-eighth Biennial Report of the Division of Fish and Game for the Years 1942-44*, State of California, Department of Natural Resources.

² California Forest and Range Experiment Station, *Forest Survey Release No. 4, March 1, 1946*. (Table 23.)

³ United States Department of Agriculture Forest Service, California Forest and Range Experiment Station, *Forest Research Notes*, No. 50, Sept. 12, 1946. (Table 23.)

TABLE 104
INDICES OF PURCHASING POWER FOR AREA 5
Deposits of Individuals, Partnerships, and Corporations^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Monterey.....	\$37,338	.87	\$52,074	.95	\$70,786	.98	\$79,349	.91
San Benito.....	5,385	.13	7,486	.14	10,606	.15	13,338	.15
San Luis Obispo.....	14,265	.34	17,990	.33	23,913	.33	29,104	.34
Santa Barbara.....	38,236	.90	45,641	.83	61,654	.86	76,539	.88
Santa Cruz.....	20,541	.48	26,655	.48	37,950	.53	48,791	.56
Ventura.....	25,127	.59	35,584	.64	51,791	.72	64,623	.75
Totals.....	\$140,892	3.31	\$185,430	3.37	\$256,700	3.57	\$311,744	3.59

Per Capita Individual Incomes^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Monterey.....	\$56,337	\$771	96.01	\$122,947	\$1,265	92.07	64.07
San Benito.....	7,724	678	84.43	18,396	1,421	103.42	109.58
San Luis Obispo.....	21,305	641	79.83	46,841	1,056	76.86	64.74
Santa Barbara.....	65,594	930	115.82	116,980	1,388	101.02	49.25
Santa Cruz.....	26,302	584	72.73	52,218	1,014	73.80	73.63
Ventura.....	49,265	707	88.04	162,392	1,842	134.06	160.54
Totals.....	\$226,527	\$748	93.17	\$519,774	\$1,374	100.00	83.69

Per Capita Assessed Valuation^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Monterey.....	\$70,224,279	\$1,308	72.79	-----	\$77,582,547	\$1,199	110.10	—8.33
San Benito.....	18,840,631	1,666	92.71	-----	14,507,865	1,420	222.22	—14.77
San Luis Obispo.....	46,339,503	1,565	87.09	-----	38,148,370	1,264	116.07	—19.23
Santa Barbara.....	160,908,377	2,469	137.40	-----	97,902,272	1,386	127.27	—43.86
Santa Cruz.....	32,180,575	860	47.86	-----	37,353,904	902	82.83	+4.88
Ventura.....	124,720,684	2,269	126.27	-----	82,043,994	1,369	125.71	—39.67
Totals.....	\$453,214,049	\$1,797	100.00	-----	\$347,538,952	\$1,254	115.15	—30.22
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Monterey.....	\$94,070,191	\$1,288	124.69	7.42	\$108,606,440	\$1,679	119.59	30.36
San Benito.....	14,968,675	1,314	127.20	—7.47	16,548,770	1,620	115.38	23.29
San Luis Obispo.....	40,645,542	1,223	118.39	—3.24	44,835,587	1,485	105.77	21.42
Santa Barbara.....	111,562,129	1,581	153.05	14.07	132,732,622	1,879	133.83	18.85
Santa Cruz.....	37,632,595	835	80.83	—7.43	40,668,894	982	69.94	17.60
Ventura.....	98,324,779	1,411	136.59	3.07	135,601,600	2,262	161.11	60.31
Totals.....	\$397,203,911	\$1,311	126.91	4.55	\$478,993,913	\$1,729	123.15	31.88

CALIFORNIA AIRPORTS

TABLE 104—Continued
 INDICES OF PURCHASING POWER FOR AREA 5
 Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Monterey.....	20,676	.38	105.56	-----	23,307	.36	102.86	—5.26
San Benito.....	4,419	.39	108.33	-----	4,428	.43	122.86	10.26
San Luis Obispo.....	11,952	.40	111.11	-----	12,632	.42	120.00	5.00
Santa Barbara.....	27,174	.42	116.67	-----	26,946	.38	108.57	—9.53
Santa Cruz.....	15,243	.41	113.89	-----	17,108	.41	117.14	-----
Ventura.....	21,861	.40	111.11	-----	21,762	.36	102.86	—10.00
Totals.....	101,325	.40	111.11	-----	106,183	.38	108.57	—5.00
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Monterey.....	31,263	.43	108.00	19.44	31,200	.32	103.23	—25.59
San Benito.....	5,249	.46	115.00	6.98	5,189	.40	129.03	—13.04
San Luis Obispo.....	14,714	.44	110.00	4.76	15,572	.35	112.90	—20.46
Santa Barbara.....	31,494	.45	113.00	18.42	29,429	.35	112.90	—22.22
Santa Cruz.....	20,024	.44	110.00	7.32	19,049	.37	119.35	—15.91
Ventura.....	27,324	.39	98.00	8.33	27,745	.31	100.00	—20.51
Totals.....	130,068	.43	108.00	13.16	128,184	.34	109.68	—20.93

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Monterey.....	\$30,522	\$568	100.35	-----	\$22,184	\$343	89.56	—39.61
San Benito.....	4,618	408	72.08	-----	2,795	274	71.54	—32.84
San Luis Obispo.....	17,178	580	103.89	-----	11,335	375	97.91	—35.34
Santa Barbara.....	47,394	727	128.45	-----	29,841	422	110.18	—41.95
Santa Cruz.....	21,253	568	100.35	-----	15,401	372	97.13	—34.51
Ventura.....	31,390	571	88.34	-----	19,782	330	86.16	—42.21
Totals.....	\$152,355	\$604	106.71	-----	\$101,338	\$366	95.56	—39.40
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Monterey.....	\$34,616	\$474	102.82	38.19	\$66,012	\$904	122.33	90.72
San Benito.....	3,921	344	74.62	25.55	6,830	600	81.19	74.42
San Luis Obispo.....	14,812	446	96.75	18.93	31,589	950	128.55	113.00
Santa Barbara.....	36,344	515	111.71	22.04	63,594	901	121.92	74.95
Santa Cruz.....	21,663	481	104.34	29.30	34,423	764	103.38	58.84
Ventura.....	26,113	375	81.34	13.64	53,274	764	103.38	103.73
Totals.....	\$137,469	\$454	98.48	24.04	\$255,722	\$844	114.21	85.90

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Indices of Purchasing Power

The indices of purchasing power listed in Table 104 show that the Area has been either very close to or exceeded the State average. There is ample evidence of sufficient wealth to back airport development and buy private planes.

Population

Table 105, giving the population of the Area from 1930 with projections for 1950 and 1955, indicates that

the population has consistently been a little over four percent of the State total. In 1950 and 1955 the projections show a slightly more rapid increase for the Area than for the State as a whole. Table 106 lists the population growth for incorporated and unincorporated cities.

The economic factors discussed presage a sound aeronautical development for the Mid-Coastal Aviation Area. Local agricultural specialties require expanded air freight. The population and influx of tourists warrant adequate passenger facilities for commercial and private planes.

TABLE 105
POPULATION OF AREA 5 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930				1945			
Monterey.....	53,705	.94		Monterey.....	97,200	1.07	33.09
San Benito.....	11,311	.20		San Benito.....	12,950	.14	13.68
San Luis Obispo.....	29,613	.52		San Luis Obispo.....	44,350	.49	33.40
Santa Barbara.....	65,167	1.15		Santa Barbara.....	84,250	.93	19.41
Santa Cruz.....	37,433	.66		Santa Cruz.....	51,500	.57	14.30
Ventura.....	54,976	.97		Ventura.....	88,150	.97	26.50
Total Area 5.....	252,205	4.44		Total Area 5.....	378,400	4.17	24.90
1935				1950			
Monterey.....	64,695	1.06	20.46	Monterey.....	106,500	1.07	9.56
San Benito.....	10,215	.17	-9.69	San Benito.....	13,700	.14	5.79
San Luis Obispo.....	30,190	.50	1.95	San Luis Obispo.....	47,800	.48	7.78
Santa Barbara.....	70,650	1.16	8.41	Santa Barbara.....	95,500	.96	13.35
Santa Cruz.....	41,410	.68	1.06	Santa Cruz.....	58,950	.59	14.47
Ventura.....	59,940	.98	9.03	Ventura.....	99,050	1.00	12.37
Total Area 5.....	277,100	4.55	9.87	Total Area 5.....	421,500	4.24	11.39
1940				1955			
Monterey.....	73,032	1.06	12.89	Monterey.....	120,500	1.08	13.15
San Benito.....	11,392	.16	11.52	San Benito.....	15,600	.14	13.87
San Luis Obispo.....	33,246	.48	10.12	San Luis Obispo.....	53,900	.48	12.76
Santa Barbara.....	70,555	1.02	-1.13	Santa Barbara.....	107,500	.97	12.56
Santa Cruz.....	45,057	.65	8.80	Santa Cruz.....	66,700	.80	13.15
Ventura.....	69,685	1.01	16.26	Ventura.....	113,400	1.02	14.48
Total Area 5.....	302,967	4.38	9.33	Total Area 5.....	477,600	4.29	13.31

Source: Same as Table 93, Page 244.

CALIFORNIA AIRPORTS

TABLE 106
POPULATION STATISTICS OF AREA 5
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 5.....		97,463	123,795	154,958	252,205	302,967	†412,900	-----
Monterey County.....		19,380	24,146	27,980	53,705	73,032	†106,000	-----
*Carmel.....	1916	-----	-----	638	2,260	†2,837	-----	-----
King City.....	1911	-----	-----	1,048	1,483	1,768	2,263	May 25, 1945
*Monterey.....	1850	1,748	4,923	5,479	9,141	10,084	11,393	Nov. 2, 1945
*Pacific Grove.....	1889	1,411	2,384	2,974	5,558	6,249	8,708	Nov. 7, 1945
*Salinas.....	1874	3,304	3,736	4,308	10,263	11,586	13,512	Mar. 23, 1946
Soledad.....	1921	-----	-----	-----	594	861	-----	-----
San Benito County.....		6,633	8,041	8,995	11,311	11,392	†15,900	-----
*Hollister.....	1874	1,315	2,308	2,781	3,757	3,881	4,875	July 9, 1946
San Juan.....	1870	449	326	501	772	678	-----	-----
San Luis Obispo.....		16,637	19,383	21,893	29,613	33,246	†50,600	-----
Arroyo Grande.....	1911	-----	-----	760	892	1,090	1,443	Sept. 9, 1946
*Paso Robles.....	1889	1,224	1,441	1,919	2,573	3,045	6,364	June 12, 1944
Pismo Beach.....	1946	-----	-----	-----	-----	2,178	-----	-----
*San Luis Obispo.....	1856	3,021	5,157	5,895	8,276	8,881	11,657	Oct. 14, 1944
Santa Barbara County.....		18,934	27,738	41,097	65,167	70,555	†88,400	-----
Guadalupe.....	1946	-----	-----	-----	-----	2,472	-----	-----
*Lompoc.....	1888	972	1,482	1,876	2,845	3,379	5,844	Aug. 8, 1944
*Santa Barbara.....	1850	6,587	11,659	19,441	33,613	34,958	38,338	May 3, 1946
*Santa Maria.....	1905	-----	2,260	3,943	7,057	8,522	10,094	April 24, 1945
Santa Cruz County.....		21,512	26,140	26,269	37,433	45,057	†61,000	-----
*Santa Cruz.....	1866	5,659	11,146	10,917	14,395	16,896	17,690	June 12, 1945
*Watsonville.....	1869	3,528	4,446	5,013	8,344	8,937	10,257	Mar. 4, 1946
Ventura County.....		14,367	18,347	28,724	54,976	69,685	†91,000	-----
*Fillmore.....	1914	-----	-----	1,597	2,893	3,252	3,662	May 23, 1946
Ojai.....	1921	-----	-----	-----	1,468	1,622	-----	-----
*Oxnard.....	1903	-----	2,555	4,417	6,285	8,519	18,979	Mar. 31, 1945
*San Buenaventura.....	1866	2,470	2,901	4,156	11,603	13,264	15,710	June 6, 1945
*Santa Paula.....	1902	-----	2,216	3,967	7,452	8,986	-----	-----

* URBAN—1940.

† Estimate of California Taxpayers' Association.

‡ Classification changed to urban in this interval.

Unincorporated Places

	Population		Population
Monterey County		Monterey County—Continued	
Aromas.....	325	Moss Landing.....	200
Big Sur.....	125	Pajaro.....	770
Blanco.....	125	Pebble Beach.....	300
Bradley.....	100	San Lucas.....	100
Castroville.....	1,113	Santa Rita.....	200
Chualar.....	300	Seaside.....	1,537
Del Monte.....	100	Spreckels.....	150
Eastmont.....	1,914	Watsonville Junction.....	300
Gonzales.....	2,008		
Greenfield.....	2,267	San Benito County	
Marina.....	150	Tres Pinos.....	175

TABLE 106—Continued
POPULATION STATISTICS OF AREA 5
Unincorporated Places

	Population		Population
San Luis Obispo County		Santa Barbara County—Continued	
Atascadero.....	1,881	Summerland.....	420
Avila.....	375	Surf.....	125
Berros.....	300	West Santa Barbara.....	1,100
Cambria.....	600		
Cayucas.....	300	Santa Cruz County	
Cholame.....	300	Aptos.....	225
Halcyon.....	125	Ben Lomond.....	450
Morro Bay.....	645	Boulder Creek.....	600
Nipomo.....	819	Capitola.....	300
Oceano.....	892	Corralitos.....	250
San Miguel.....	500	Davenport.....	650
Santa Margarita.....	725	Felton.....	400
Shell Beach.....	150	Freedom.....	826
Templeton.....	400	Olympia.....	125
		Soquel.....	1,037
Santa Barbara County		Swanton.....	175
Betteravia.....	300		
Buellton.....	150	Ventura County	
Carpinteria.....	1,389	Camarillo.....	325
Casmalia.....	200	El Rio.....	764
Cuyama.....	100	Greenwich Village.....	950
Gary.....	100	Hueneme.....	750
Gaviota.....	175	Montalvo.....	275
Goleta.....	1,317	Moorpark.....	1,138
Los Alamos.....	225	Newbury Park.....	150
Los Olivos.....	370	Piru.....	733
Montecito.....	1,740	Santa Susana.....	175
Naples.....	100	Saticoy.....	1,382
Orcutt.....	592	Simi.....	250
Santa Ynez.....	526	Somis.....	325
Solvang.....	659	Springville.....	175

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

The terrain of Area 5 readily adaptable to airport construction is confined to restricted level areas immediately adjacent to the ocean and the floor of the Salinas Valley, a narrow strip in Monterey County six to ten miles wide and 100 miles long. Because of this fact the majority of the operating airports in this area

are found along the coast, with a few additional facilities located in the Salinas Valley, the north-eastern foothills of San Luis Obispo County and the various mountain districts. The location and description of these airports is listed below:

Plate M-5 Code	City and Airport Name	Ownership	Class
VENTURA COUNTY			
5-1	San Nicolas Is.—NOLF.....	U. S. Navy.....	S-5
5-2	Point Mugu—NAAS.....	U. S. Navy.....	5
5-25	Oxnard—Ventura County.....	County of Ventura.....	4
5-26	Oxnard Flight Strip.....	County of Ventura.....	4
5-50	Camarillo—Conejo Valley.....	Commercial-Private.....	S-2
5-51	Camarillo—Hidden Valley.....	Private.....	S-2
5-52	Santa Susana.....	Commercial-Private.....	1
5-53	Piru—Camulos Ranch.....	Private.....	S-2
5-54	Fillmore.....	Commercial-Private.....	1
5-55	Bardsdale.....	Private.....	S-2
5-56	Santa Paula—Bassett.....	Commercial-Private.....	1
5-57	Santa Paula—Harvey.....	Commercial-Private.....	S-2
5-58	Saticoy.....	Commercial-Private.....	S-2
5-59	Ojai—Henderson.....	Commercial-Private.....	S-1
5-60	Ojai—Santa Ana Valley.....	Private.....	1

Plate M-5 Code	City and Airport Name	Ownership	Class
SANTA BARBARA COUNTY			
5-5	Lompoc—Camp Cook Flt. Strip	U. S. Army	2
5-6	Maricopa—Cuyama Valley	U. S. F. S.	1
5-30	Santa Barbara Municipal	City of Santa Barbara	4
5-31	Santa Maria (AAB)	County of Santa Barbara	4
5-32	Lompoc Airpark (N-LTA)	County of Santa Barbara	S-1
5-70	Santa Ynez—Crawford Ranch	Private	S-1
5-71	Santa Ynez—Keck Ranch	Private	1
5-72	Solvang—Buellton	Private	1
5-73	Santa Maria—Hancock	Commercial-Private	2
5-74	Santa Maria—Machado	Commercial-Private	1
5-75	Lompoc	Commercial-Private	1
SAN LUIS OBISPO COUNTY			
5-35	San Luis Obispo—Calif. Poly.	State of California	S-2
5-36	San Luis Obispo County (NOLF)	County of San Luis Obispo	3
5-37	Paso Robles—Estrella (AAFld.)	County of San Luis Obispo	4
5-38	Paso Robles—Sherwood	City of Paso Robles	2
5-80	Nipomo—Dorman's	Commercial-Private	1
5-81	Morro Bay	Commercial-Private	S-1
5-84	Cambria	Private	S-1
5-85	San Simeon—Hearst Ranch	Private	1
5-86	Paso Robles—Hillman Ranch	Private	1
5-87	Creston—Quintana Ranch	Private	S-1
5-88	Soda Lake—Arnold Ranch	Private	1
MONTEREY COUNTY			
5-15	Watsonville—(NAAF-LTA)	U. S. WAA	S-1
5-40	Salinas Municipal (AAFld.)	City of Salinas	4
5-41	Monterey Peninsula (NAAS)	Airport District	4
5-42	King City Municipal (NAAS)	City of King City	3
5-90	San Ardo	Private	S-1
5-91	Carmel—Carmel Valley	Commercial-Private	S-2
5-92	King City—Kathy	Commercial-Private	1
SANTA CRUZ COUNTY			
5-45	Watsonville Municipal (AAFld.)	City of Watsonville	4
5-95	Santa Cruz Airport	Commercial-Private	1
5-96	Santa Cruz Sky Park	Commercial-Private	1
5-97	Boulder Creek	Commercial-Private	1
SAN BENITO COUNTY			
5-48	Hollister Municipal (NOLF)	City of Hollister	3

At the present time there is a relatively high aviation activity on the coastal airports, including feeder line operation, skip-stop service, transit private plane flights and local private plane flying, to a point where additional and further developed airports must soon be programmed to meet a steadily growing need. A sizeable factor of private and charter planes transporting weekenders and vacationists into the Area must be taken into consideration in any planning because of the year-round resort potential which now attracts a high annual surface travel.

ESTIMATES OF SCHEDULED AIR TRAFFIC

At this time Area 5 is served by a greater number of air carrier flights than any other section of the State, with the exception of the terminal cities of San Diego, Los Angeles and San Francisco, and its trading centers are directly connected with all the major commercial areas of California.

United Airlines provides two daily scheduled air services from Los Angeles to Santa Barbara, Monterey or Salinas, San Francisco and return, with an additional daily flight contact on the San Francisco, Modesto, (Salinas), Visalia and Los Angeles run. Southwest Airways has two daily feeder line operations each way, with stops at Oxnard-Ventura, Santa Barbara, Santa Maria, San Luis Obispo, Coalinga (Fresno County—Area #6), Monterey, Santa Cruz, San Jose (Santa Clara County—Area #9) and major terminals of Los Angeles and San Francisco.

The experience of skip-stop and feeder line service indicates that the air line stops in Area 5 use approximately two seats per scheduled flight, both arriving and departing. Applying this factor to the present population, and the ratio thus developed to the increased population for 1950 and 1955 and the corresponding

public interest in commercial flying, Area 5 will need approximately 44 daily commercial flight contacts in 1950 and 65 in 1955. Translating these figures into daily landings per stop, the Monterey-Salinas area can expect 12 per day in 1950 and 17 per day in 1955, while the other 5 stops can expect from 7 to 10 a day in 1950 and from 10 to 14 a day in 1955.

This number of flights would serve the following passenger potentials, according to location:

Airline Stop	Annual On and Off Passengers	
	1950	1955
Monterey-Salinas	16,266	24,140
Oxnard-Ventura	13,437	19,517
San Luis Obispo	4,243	6,163
Santa Barbara	9,194	13,867
Santa Cruz	13,083	19,003
Santa Maria	4,243	6,163
Total	60,466	88,853

The cities of Paso Robles, in San Luis Obispo County, and King City, in Monterey County, are also being considered for feeder line stops, and this service would undoubtedly increase the airline passenger potential of this area.

Current commercial airport facilities in Area 5 can logically anticipate a considerable air freight carrier use; however, that type of activity will be mainly concentrated in Monterey County. Although lettuce and romaine are the major agricultural production in this area that may be shipped by air, other vegetables will contribute shipment quantity as shown by the following table and analysis of agricultural perishables having an air freight potential:

County	Commodity	1945		1950		1955	
		Car-loads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Monterey	Broccoli	355	4,260	0	-----	5	42.6
	Cabbage	165	1,980	2	39.6	7	138.6
	Cauliflower	35	420	0	-----	6	25.2
	Celery	1,318	15,816	0	-----	7	1,107.1
	Lettuce and Romaine	25,686	308,232	6	18,493.9	18	55,481.8
	Mixed Deciduous Fruit	1	14	2	.3	8	1.1
	Mixed Vegetables	4,540	54,480	0	-----	6	3,268.8
	Peas, Green	36	360	3	10.8	17	61.2
	Peppers	1	12	5	.6	14	1.7
	Plums and Fresh Prunes	3	45	1	.5	13	5.9
	Spinach	5	45	4	1.8	15	6.8
	Tomatoes	322	4,186	23	962.8	43	1,800.0
	Total	32,467	389,850	-----	19,510.0	-----	61,941.0
San Benito	Cabbage	8	96	2	1.9	7	6.7
	Cauliflower	56	672	0	-----	6	40.3
	Celery	76	912	0	-----	7	63.8
	Lettuce and Romaine	1,475	17,700	6	1,062.0	18	3,186.0
	Mixed Vegetables	112	1,344	0	-----	6	80.6
	Peas, Green	34	340	3	10.2	17	57.8
	Total	1,761	21,064	-----	1,074.0	-----	3,435.0
San Luis Obispo	Cauliflower	182	2,184	0	-----	6	131.0
	Celery	242	2,904	0	-----	7	203.3
	Lettuce and Romaine	19	228	6	13.7	18	41.0
	Mixed Vegetables	168	2,016	0	-----	6	121.0
	Peas, Green	6	60	3	1.8	17	10.2
	Total	617	7,392	-----	16.0	-----	507.0
Santa Barbara	Apricots	4	60	2	1.2	8	4.8
	Beans (Snap and Lima)	24	240	10	24.0	50	120.0
	Broccoli	182	2,184	0	-----	5	109.2
	Cabbage	273	3,276	2	65.5	7	229.3
	Cauliflower	3,227	38,724	0	-----	6	2,323.4
	Celery	954	11,448	0	-----	7	801.4
	Lettuce and Romaine	1,137	13,644	6	818.6	18	2,455.9
	Peas, Green	36	360	3	10.8	17	61.2
	Peppers	7	84	5	4.2	14	11.8
	Spinach	1	9	4	.4	15	1.4
	Tomatoes	848	11,024	23	2,535.5	43	4,740.3
	Turnips and Rutabagas	1	19	0	-----	14	2.7
	Total	6,694	81,072	-----	3,460.0	-----	10,861.0

County	Commodity	1945		1950		1955	
		Car-loads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Santa Cruz-----	Broccoli-----	10	120	0	-----	5	6.0
	Cabbage-----	42	504	2	10.1	7	35.3
	Cauliflower-----	17	204	0	-----	6	12.2
	Celery-----	97	1,164	0	-----	7	81.5
	Greens (Except Spinach)-----	202	1,818	5	90.9	18	327.2
	Lettuce and Romaine-----	4,120	49,440	6	2,966.4	18	8,899.2
	Mixed Deciduous Fruit-----	2	28	2	.6	8	2.2
	Mixed Vegetables-----	699	8,388	0	-----	6	503.3
	Pears-----	31	465	0	-----	2	9.3
	Plums and Fresh Prunes-----	19	285	1	2.9	13	37.1
	Tomatoes-----	204	2,652	23	610.0	43	1,140.4
	Total-----	5,443	65,068	-----	3,681.0	-----	11,054.0
Ventura-----	Beans (Snap and Lima)-----	4	40	10	4.0	50	20.0
	Cabbage-----	5	60	2	1.2	7	4.2
	Cauliflower-----	137	1,644	0	-----	6	98.6
	Celery-----	67	804	0	-----	7	56.3
	Lettuce and Romaine-----	97	1,164	6	69.8	18	209.5
	Mixed Vegetables-----	61	732	0	-----	6	43.9
	Tomatoes-----	171	2,223	23	511.3	43	955.9
	Total-----	542	6,667	-----	586.0	-----	1,388.0
	Area Total-----	47,524	571,113	-----	28,327.0	-----	89,186.0

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945*.
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

Changing the foregoing tonnage figures into airplane loads, establishes the following possible daily schedules:

Equalizing between the possible number of DC-3 and DC-4 schedules, this Area has a daily potential of 52 planeloads in 1950 and 163 planeloads in 1955.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

AREA 5

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total-----		28,327	11,331	85	2,496	19
Monterey-----	260	19,510	7,804	60.03	1,719	13.22
San Benito-----	257	1,074	430	3.35	95	.74
San Luis Obispo-----	320	16	6	.04	1	.01
Santa Barbara-----	331	3,460	1,384	8.36	305	1.84
Santa Cruz-----	271	3,681	1,472	10.86	324	2.39
Ventura-----	232	586	235	2.03	52	.45
1955 Total-----		89,186	35,674	266	7,858	59
Monterey-----	260	61,941	24,776	190.58	5,457	41.98
San Benito-----	257	3,435	1,374	10.69	303	2.36
San Luis Obispo-----	320	507	203	1.27	45	.28
Santa Barbara-----	331	10,861	4,344	26.25	957	5.78
Santa Cruz-----	271	11,054	4,422	32.63	974	7.19
Ventura-----	232	1,388	555	4.78	122	1.05

* Source: *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

Combining projections of commercial passenger and air freight activity, the following maximum commercial landings are forecast.

This summary of air activity indicates a comparatively high airport use by commercial operations that will tend to decrease the airport service that can be made available to private flying, thereby giving added emphasis to the need for programming additional airports in certain areas. Likewise this traffic potential calls attention to the need for maintaining full-scale commercial airports, capable of handling large aircraft, at each trading center in Area 5.

Location	Passengers		Air Freight		Total	
	1950	1955	1950	1955	1950	1955
Monterey-Salinas.....	12	17	*39	*123	51	140
Oxnard-Ventura.....	10	14	1	3	11	17
San Luis Obispo.....	10	14	-----	1	10	15
Santa Maria.....	10	14	†(2)	†(8)	10	14
Santa Barbara.....	10	14	5	16	15	30
Santa Cruz.....	10	14	7	20	17	34
Total.....	62	87	52	163	114	250

* Includes air freight potential of San Benito County.

† Possible loading point for part of Santa Barbara and San Luis Obispo Counties air freight potential.

PRIVATE FLYING ESTIMATES

By means of a combined index of economic buying potential, and present plane ownership, a projected distribution of private plane ownership by county for 1950 and 1955 is as follows:

County	Index	Private plane ownership	
		1950	1955
Monterey.....	108	222	519
San Benito.....	55	15	36
San Luis Obispo.....	99	92	213
Santa Barbara.....	140	271	635
Santa Cruz.....	64	72	169
Ventura.....	142	279	661
TOTAL.....		951	2,233

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in the Non-Scheduled Aviation Projection, Part V.

MONTEREY COUNTY

Township	Percent	1950	1955
Alisal.....	35.35	78	183
Bradley.....	.17	—	1
Castroville.....	3.59	8	19
Cholame.....	.16	—	1
Gonzales.....	3.87	9	20
King City.....	5.30	12	27
Monterey.....	36.38	81	189
Pacific Grove.....	8.02	—	—
Pajaro.....	3.49	8	18
Peachtree.....	.34	1	2
San Antonio.....	.64	1	3
San Ardo.....	.29	—	—
Soledad.....	2.40	5	12

SAN BENITO COUNTY

Township	Percent	1950	1955
Hollister.....	78.13	12	28
Panoche.....	1.67	—	1
San Benito.....	3.03	—	1
San Juan.....	11.92	2	4
Tres Pinos.....	5.25	1	2

SAN LUIS OBISPO COUNTY

Township	Percent	1950	1955
Arroyo Grande.....	15.52	14	33
Atascadero.....	5.60	5	12
Cholame.....	1.57	2	4
Morro.....	12.18	11	26
Nipomo.....	4.33	4	9
Paso Robles.....	16.84	16	36
San Luis Obispo.....	35.74	33	76
San Miguel.....	1.55	1	3
San Simeon.....	2.51	2	5
Santa Margarita.....	2.50	2	5
Templeton.....	1.66	2	4

SANTA BARBARA COUNTY

Township	Percent	1950	1955
1.....	16.54	45	105
2.....	47.63	129	303
3.....	7.29	20	46
4.....	1.93	5	12
5.....	6.93	19	44
6.....	.41	1	3
7.....	14.46	39	92
9.....	3.19	9	20
10.....	1.62	4	10

SANTA CRUZ COUNTY

Township	Percent	1950	1955
Santa Cruz.....	59.27	43	100
Watsonville.....	40.73	29	69

VENTURA COUNTY

Township	Percent	1950	1955
Camarillo.....	8.06	22	53
Fillmore.....	6.63	19	44
Hueneme.....	3.20	9	21
Ojai.....	8.29	23	55
Oxnard.....	21.89	61	145
Piru.....	.93	3	6
Santa Paula.....	3.69	38	91
Simi.....	2.33	7	15
Ventura.....	34.98	97	231

Certain sections of Area 5 will require additional small plane facilities; however, all sections in the Area need operating airports brought up to full CAA recommended standards.

AIRPORT REQUIREMENTS

MONTEREY COUNTY

Carmel Area

Consideration should be given to the development of a Class 1 airport near the beach in the neighborhood of Point Lobos, Pebble Beach, and Carmel, as the present S-2 facility is too far distant for ready access. The recreational appeal of this beautiful section of the State is well known. The townships of Monterey and Pacific Grove are expected to own 99 aircraft by 1950 and 231 by 1955. When this airplane potential is added to the possible hundreds of aircraft of visitors, the need of a Class 1 facility at this point by 1950 to supplement the Monterey Peninsula Airport is evident.

San Ardo

San Ardo is a small village, in the southern end of Salinas Valley, flanked by two ranges of mountains. There is a private S-1 field here but the owner does not intend to expand. San Ardo lies on the Los Angeles-Seattle Amber 8 Civil Airway and on the natural line of flight between Paso Robles, 30 miles southeast, and King City, 18 miles northwest, where the nearest airports are located. A landing facility here would be valuable to itinerant pilots in case of emergency. The National Airport Plan for 1947 lists a Class 1 airport at San Ardo, and the present study concurs in this recommendation.

Soledad

Soledad has a population of over a thousand and serves a trading district of several thousand. It is located 18 miles from King City and 24 miles from Salinas, and an airport here would be useful to fill a gap between those two cities. The plane potential of the township is 5 for 1950 and 12 for 1955. Soledad is one of the entries to Pinnacles National Monument, which attracted almost 16,000 visitors in 1946. (Table 17). It is believed that a Class 1 airport should be constructed here by 1950.

SAN BENITO COUNTY

San Benito County will not need additional private plane facilities because of the terrain, a low ownership potential, and a good airport at Hollister. The State Forestry Service has requested a number of airports here. To satisfy these forest patrol needs the present study recommends that a Class 1 airport be built at Llanda by 1955 and a Class 1 facility at San Benito by 1950. Inasmuch as San Benito is near the eastern entry to Pinnacles National Monument, private light aircraft might make some use of an airport at this point.

SAN LUIS OBISPO COUNTY

Arroyo Grande-Pismo Beach

The County has recommended that an airport be constructed at a site best suited to serve the needs of Arroyo Grande, Pismo Beach, Grover City and Oceano. Pismo Beach boasts of having the longest beach on the Pacific Coast, and thousands of visitors throng the district during the summer to enjoy the ocean sports. Consideration should be given both to the private aircraft requirements of these visitors and the local airplane ownership potential of 14 in 1950 and 33 in 1955. The district is also the center of extensive truck gardening and flower raising. There is the distinct possibility of developing potential air freight for this produce. It is therefore advised that a Class 1 airport be constructed in this neighborhood by 1950, to be increased to a Class 2 facility by 1955, with a view to further enlargement if local air freight warrants.

Atascadero

Atascadero, 11 miles south of Paso Robles, has a population of 2,000. It is predicted that private plane ownership here will reach 5 in 1950 and 12 in 1955. The County has proposed a Class 2 facility as one of a chain of airports in the Salinas Valley. Atascadero lies close to the coast airway, Amber No. 8, and an airport at this point would be valuable for emergency use. Because of its nearness to Paso Robles and San Luis Obispo, and its low aircraft potential, only a Class 1 facility is recommended and that not until 1955.

Cambria

Cambria is a small town on the seacoast with a population of 600. During the summer, however, this population is swelled considerably by inhabitants of the interior valleys seeking the coolness of local beaches. At present there is a substandard Class 1 strip owned by the Cambria Development Company. The National Airport Plan for 1947 proposes that this strip be acquired and improved to full Class 1 standards, and this study considers the acquisition desirable.

Cholame-Shandon

The County considers establishment of an airport in this northeastern part of the County desirable, mainly to serve as an emergency landing field for the large amount of private flying developing between the coast and the San Joaquin Valley. Although this district is sparsely settled and probably could not support an airport by local potentials, a Class 1 facility is recommended here by 1950 to serve the emergency needs of itinerant aircraft.

La Panza

The State Forestry Service has requested an airport at this point as a facility for forest patrol, and the County also considers such an establishment desirable to serve emergency needs. It is therefore recommended that a Class 1 facility be considered for this vicinity by 1950.

Morro Bay

Morro Bay is located on the ocean, 16 miles northwest of San Luis Obispo. The resident population is about a thousand, but this number is augmented considerably at times by visitors from the San Joaquin Valley and tourists coming to view Morro State Park and 576-foot high Morro Rock. The local aircraft potential is estimated at 11 for 1950 and 26 for 1955. The community is served at present by a Class S-1 airport. The County considers a full standard Class 1 airport necessary here but no site has been selected for development. The 1947 National Airport Plan also includes a Class 1 facility for Morro Bay. A Class 1 airport in this vicinity by 1950 is therefore recommended in this report.

Sycamore Canyon

The State Forestry Service has requested an airport in this central southern part of the County. To comply with this request, and also to furnish an emergency landing facility in a district where few facilities are available, it is believed that a Class 1 airport should be provided in Sycamore Canyon by 1955.

SANTA BARBARA COUNTY**Carpinteria**

The Carpinteria Valley is situated on the coast in the extreme southeastern corner of Santa Barbara County. It is on the northern edge of the Los Angeles-San Francisco coastal airway, 18 air miles from Santa Barbara and 22 air miles from Oxnard. The airway crosses over water here and Carpinteria would offer an emergency landing area between two airports. The population of the immediate vicinity amounts to 6,000 but to this must be added the residents of Montecito, a high income suburb of Santa Barbara, which would be closer to the Carpinteria than the Santa Barbara airport. It is believed that with an improved water supply, now being planned, the population may rapidly double. Carpinteria Beach is a major attraction with 1,000 visitors on peak days. There are plans afoot to enlarge the State Park situated here and to build a yacht harbor. The County has chosen the Slough site within walking distance of the town, the beach, and the State Park for a Class 1 airport. The development of a facility of this class is contained in the National Plan of Airports for 1947. To satisfy the private aircraft requirements of inhabitants and visitors a Class 1 facility should be developed here by 1950.

Cuyama

The United States Forestry has asked for a Class 2 airport at this locality in the extreme northeastern corner of the County. There is an existing Class 1 facility, 16 miles southwest of Maricopa, for use of the local Ranger Station. It is recommended that a Class 2 facility be developed at Cuyama to meet the requirements of the forestry aircraft and serve as an emergency landing field for itinerant pilots in this remote section far from other airports.

Gaviota

The County wishes an emergency landing facility at Gaviota for pilots of light aircraft who may have followed Highway No. 101 to this point. Gaviota is also the natural turning point for those flying up the coast who wish to proceed to Lompoc or Santa Maria. The County Beach Park here is visited by 20,000 annually. A Class 1 facility is desirable at Gaviota by 1950 to serve these various private flying needs.

Los Alamos

The County Master Airport Plan envisions a network of Class 1 facilities to increase the safety of flying as more than half of the County is mountainous. Los Alamos is considered the first in importance of these new airports. Los Alamos is located about midway on the 29 mile gap between Santa Ynez and Santa Maria, on the coastal airway. The town itself is small and separated from the two points just mentioned by hills 1,200 feet high. A Class 1 airport here is in the 1947 National Airport Plan and Program. For the preceding reasons, it is believed that a Class 1 facility should be installed here by 1950. Inasmuch as the United States Forestry Service wishes a Class 2 airport at this location, it is recommended that provision be made for expansion to Class 2 by 1955.

Santa Barbara

Santa Barbara is the County Seat, a city with an estimated population of 48,000 in 1944, in the center of the California Riviera, a famous sport and recreation area. There is considerable local interest in private flying and there is an estimated potential, possibly too low, of 129 private planes by 1950 and 303 by 1955. Two airlines make scheduled stops here and there are possibilities of their number being increased. At the end of 1946 there were 8 large cargo and charter airplanes based on the local field. The County has suggested improving the present Class 4 municipal airport to Class 6 in line with its long range planning of making Santa Barbara a main passenger and air cargo terminal. Air cargo potentials should be large at this airport since Santa Maria and Santa Barbara are the only two facilities in the County large enough and equipped to handle air freight in quantity. The potential passenger volume has been discussed in the treatment on estimates of scheduled air traffic. The National Airport

Plan for 1947 includes improvements of the Santa Barbara Airport to Class 6 standards. The present study recommends improvement to Class 5 by 1950.

Santa Ynez

Santa Barbara County has given the development of a Class 3 facility at Santa Ynez, at a site tentatively chosen 1 mile southeast of town, priority in its airport plan. Santa Ynez is located in the upper Santa Ynez Valley directly on the Los Angeles-San Francisco air route, 19 air miles from Santa Barbara Municipal Airport, from which it is separated by the Santa Ynez Mountain Range, and 29 air miles from the Santa Maria Airport. An airport here could serve as an alternate when weather conditions made landing at Santa Barbara impossible, and would meet the needs of pilots flying from Santa Barbara to Santa Maria and forced to land north of the Santa Ynez Range. The population of the several surrounding villages is 1,200. Agriculture is the principal industry and new irrigation projects will extend the irrigable land 150 percent. It is believed that eventually there will be several hundred tons of air cargo annually. The Santa Ynez Mission, the Mojoqui Falls, and the new recreational area to be developed around the proposed Cachuma Dam, will continue to attract numerous visitors. Some of the best fishing in Southern California is found nearby. Dude ranches are another potential tourist attraction. Two existing private airports, a Class 1 and a Class S-1, three proposed private strips, and the active Solvang Flying Club attest to the interest of the population in private flying. The only surface transportation at present is by bus at Buellton, 3 miles westward. The 1947 National Airport Plan includes the development of a Class 2 airport at Santa Ynez and the United States Forestry Service requests a Class 2 facility. It is believed that the above reasons indicate the advisability of a Class 2 airport here by 1950.

SANTA CRUZ COUNTY

Santa Cruz

This all year round resort city is famous for its sea bathing, deep sea fishing, and fishing in close by streams. Situated 72 miles south of San Francisco, Santa Cruz has a resident population of 18,000 which sometimes mounts to 30,000. It is predicted that the area will have 72 private airplanes in 1950 and 169 in 1955. As the popularity of private flying extends, more and more vacationists should arrive by airplane. The opportunity to spend the weekend at Santa Cruz will no longer be confined to persons within comfortable driving distance but will be available to private flyers throughout the State. The city is served at present by two Class 1 airports. The city has acquired a new site and the construction of a Class 1 facility here is contained in the National Airport Plan for 1947. This study concurs that there should be a Class 1 airport at Santa Cruz by 1950 and believes increasing use will indicate improvement to Class 2 by 1955.

VENTURA COUNTY

Camarillo

Camarillo is located in the extreme south of the County, 15 air miles from Oxnard, on the direct airway between Oxnard and Los Angeles. The population of the surrounding area is about 7,000. It is believed that the area will have 22 airplane owners in 1950 and 53 in 1955. A private S-2 airport is presently located about 10 miles east southeast. It is recommended that a more convenient site be acquired and a Class 1 facility be constructed by 1955 to accommodate local airplane owners.

Fillmore

Fillmore, 25 miles east of Ventura and 9 miles from the nearest airport at Santa Paula, is situated in an agricultural area supporting a population of 6,000. The town itself has only half this population. Close by lies the mouth of the Sespe Canyon, frequented by sportsmen for deer and quail hunting and trout fishing. Several private aircraft are based on a Class 1 privately owned airport. A recent survey has shown that 20 residents intend to buy airplanes shortly. The County is interested in a Class 1 facility here and a similar recommendation is found in the National Airport Plan for 1947. Because of the possible airplane ownership and the recreational attractions, the present study concurs.

Lockwood Valley

Ventura County is interested in developing a recreational area in this remote, north central section of the County, where there would be unlimited opportunities for camping, hunting, and fishing. An airport in Lockwood Valley would undoubtedly facilitate this recreational development. The forestry service should also favor locating a landing facility at this location in the midst of the Los Padres National Forest. Because of distances from other airports, facilities for emergency landings would be appreciated by itinerant pilots. It is recommended for the preceding reasons that a Class 1 airport be constructed at Lockwood Valley by 1950.

Ojai

Ojai is situated in a valley at the head of the Ventura River, about 12 air miles from both Ventura and Santa Paula. It is mainly a residential center and the entrance to a National Forest Area. It is predicted that Ojai has a potential airplane ownership of 23 in 1950 and 55 in 1955. The community is served at present by a private S-1 facility. To serve adequately the requirements of private flying and give the County a better airport coverage it is proposed that a Class 1 facility be provided for Ojai by 1955.

Santa Paula

Santa Paula is located 16 miles east of Ventura. It has a population of 9,000 and serves a trading area of about 11,000. There are 24 local airplane owners at present and a recent survey indicates the possibility

of this number doubling within three years. A private Class 1 and Class S-2 airport serve the community now. A publicly owned Class 1 facility is envisioned by the National Airport Plan for 1947 and Ventura County wishes a similar facility. Inasmuch as the United States Forestry Service thinks a Class 2 airport highly desirable at this point, it is recommended that a Class 2 airport be built to satisfy both the needs of forest patrol and private flying.

Ventura

Ventura, the County Seat, has a population of over 13,000 and draws from a trading area of over 30,000.

It is considered one of the wealthiest cities of its size in the west. It lies on the direct line of flight between Santa Barbara and Oxnard. The nearest airport at present is Oxnard, 11 miles to the southeast. The latter facility will soon reach saturation for handling private aircraft. It is believed that Ventura will have at least 97 private planes in 1950 and 231 in 1955. Ventura County wishes a Class 1 facility here and the National Airport Plan for 1947 agrees. It is believed that local potential plane ownership justifies constructing a Class 1 airport at Ventura by 1950 and improving this to Class 2 by 1955.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 5

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Monterey County							
Carmel Area				1	R,NS		
San Ardo				1	NS		
Soledad				1	NS,R		
San Benito County							
Llanada						1	FS
San Benito				1	FS,NS,R		
San Luis Obispo County							
Arroyo Grande-Pismo Beach				1	R,NS	2	R,NS
Atascadero						1	NS
Cambria				1	NS,R		
Cholame-Shandon				1	NS		
La Panza				1	FS,NS		
Morro Bay		Private	S-1	1	R,NS		
Sycamore Canyon				1	FS		
Santa Barbara County							
Carpinteria				1	NS,R		
Cuyama-Maricopa		Public	1	2	FS		
Gaviota				1	R,NS		
Los Alamos				1	NS	2	FS,NS
Santa Barbara	Municipal	Public	4	5	FP,NS,R,C		
Santa Ynez				2	FS,NS,R		
Santa Cruz County							
Santa Cruz				1	R,NS	2	R,NS
Ventura County							
Camarillo	Conejo Valley	Private	S-2			2	NS
Fillmore		Private	1	(New) 1	NS,R		
Lockwood Valley				1	NS,FS,R		
Ojai	Henderson	Private	S-1			1	NS,R
Santa Paula	Bassett	Private	1	2	FS,NS		
Ventura				1	NS	2	NS

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

APPENDIX 6

AREA 6—FRESNO METROPOLITAN

NATURAL CHARACTERISTICS

Area 6, the second largest aviation area in California, is composed of Madera, Fresno, Tulare, and Kings Counties—all geographically and economically similar and closely related.

Geography and Topography

The Fresno Metropolitan Area lies in the geographical center of the State with Merced and Mariposa Counties on the north, Mono and Inyo on the east, Kern on the south, and Monterey and San Benito Counties on the west. The central portion is composed of the southern end of the San Joaquin Basin with rapidly rising hills and mountains on the east and west. The eastern boundary of the Area follows the summit of the Sierras with picturesque mountain scenery famous throughout the world; the western boundary adjoins the foothills of the Coast Range in Kings County, shares the Table Top Range with Monterey, and extends along the first line of ridges of the Diablo Range in Fresno County. Such a topography results in extremes of elevation. The western level valley region of Madera County is only 110 feet above sea level; Mount Whitney in Tulare County rises to a height of 14,496 feet, the highest point in the United States.

The San Joaquin, Kings, Tule, Kaweah, St. Johns and other rivers have their sources in the Sierras and flow across the valley bottoms, providing an excellent source of natural water supply and leaving rich deposits of alluvial soil for the fertile farms of the Area. Dam control systems and the eventual development of the Central Valleys Project will afford adequate irrigation for the entire district. Pumping wells already tap the abundant underground water storage and furnish an important source of supplementary irrigation.

Land Usage

An examination of the land usage of Area 6 indicates the relative importance of agriculture, lumbering,

and tourist trade in the Area's industrial economy. The 9,198,720 acres are at present used as follows, (from Table 15) :

	<i>Acres</i>	<i>Acres</i>
Land used for crops-----	1,252,949	
Idle cropland and arable pasture	967,050	
Farm woodland -----	1,732,050	
Forest and all other-----	1,333,352	
Total privately owned land--		5,285,401
National Parks and Forests----	3,180,133	
Other public lands-----	733,186	
Total public lands-----		3,913,319

Climate

General climatic conditions follow the pattern of those of the San Joaquin Valley—a rainless, warm period between May and September, followed by cooler Autumn months with relatively little variation in temperature; a rainy season during December, January, and February; and again a stretch of equable weather during the Spring months. On the floor of the valley the average temperatures are about 45° and the July temperatures about 80° with an average rainfall of between 8 and 10 inches. In the higher altitudes, the temperatures are more severe, ranging from an average of 30° in January to 60° in July at Huntington Lake in Fresno County at an elevation of 7,000 feet. Precipitation in the mountains is normally between 30 and 40 inches a year.

The climate of Area 6 has determined the nature of certain of its basic industries. The exceptionally long growing season, extending from 243 to 289 days per year with unbroken sunshine throughout Summer and early Autumn, favors the maturing and curing of the large variety of agricultural products raised. In the National Parks and recreation areas the pleasant, sunny days with cooler evenings have been an important factor in increasing the volume of tourist travel.

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

A study of the industries of the Area shows a steady development dependent to a large degree on a well integrated marketing system. Any improvement in transportation, especially in the direction of greater speed and more flexibility, will open up new and larger

markets to the produce of the district. The use of air freight for local specialties and perishables is bound to accelerate the present industrial development. The population has been constantly increasing, and there is sound evidence of growth in per capita wealth. The area

should thus offer a good market for private planes and airplane passenger travel. The multitudes of tourists visiting the world-renowned parks and forests will augment the need for better facilities for private planes and for expanded airplane passenger service.

Agriculture

Concentrated in the rich valley bottoms of Area 6 are some of the major agricultural production centers of the United States, and the great diversity of crops and livestock raised results in an unusually constant harvesting and shipping season. Listed below according to monetary value are the five leading agricultural products of each county (from Table 24).

County	1st	2nd	3rd	4th	5th
Fresno	Grapes	Cotton	Dairy	Flax	Beef
Kings	Cotton	Dairy	Beef	Barley	Grapes
Madera	Cotton	Beef	Grapes	Dairy	Barley
Tulare	Oranges	Cotton	Grapes	Beef	Dairy

Source: California State Chamber of Commerce.

In 1940 Fresno was the foremost county in the State in the value of raisin grapes and figs produced, Kings was first in barley, and Tulare led in the value of beef production.

The diversity and volume of agricultural produce in the area are further illustrated by the number of carloads shipped from the four counties in 1945:

Although any comparison of dollar value must be read in the light of the national increase in prices, an examination of the totals involved shows that the cash farm income in Area 6 increased much more rapidly from 1940 to 1945 than it did in the United States or in California as a whole:

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Fresno	Kings	Madera	Tulare
Apples				9
Apricots		2		
Asparagus	6			
Broccoli	45			
Cabbage				1
Cantaloupe	3,439	149	31	68
Carrots	794		8	
Casabas	13		15	
Cauliflower				20
Celery				304
Cucumbers				1
Grapefruit	50			182
Grapes	7,570	402	108	6,784
Honeydew Melons	265	176		295
Lemons	31			419
Lettuce and Romaine	363			140
Mixed Citrus Fruit				74
Mixed Deciduous Fruit	48			7
Mixed Melons	268			25
Mixed Vegetables	42			2
Onions	16			
Oranges and Satusmas	1,305			11,346
Peaches	1,236	111	20	493
Peaches (Dried)	137	52		
Peas, Green	104		15	18
Persian Melons	125	7		1
Plums-Fresh Prunes	671			787
Potatoes	284		817	1,747
Prunes, Dried	38			48
Tomatoes	138		41	158
Watermelons	524	52	21	86
Total	17,512	951	1,076	23,015
Grand Total				42,554

Source: California Carlot Shipments, Fruits and Vegetables, 1945, California Crop and Livestock Reporting Service and Federal-State Market News Service.

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			Percent change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Fresno	39,200	5.83	.47	123,687	6.92	.60	215.53
Kings	12,500	1.85	.15	32,711	1.83	.16	161.69
Madera	9,400	1.40	.12	23,512	1.32	.11	150.12
Tulare	41,900	6.23	.50	133,910	7.50	.64	219.59
Total Area	\$103,000	15.31	1.24	\$313,820	17.57	1.51	204.68

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States*, 1946.

The agricultural perishables produced in the Area will find air freight of great assistance in developing a wider market. An estimated volume potential of such

air freight will be found later. Aircraft have already been used locally for seeding and crop dusting, and the demand for such services will increase with improved

techniques and facilities. Agriculture will both require and be benefited by extended airplane service.

Timber Production

The forests of Area 6, found principally in Fresno, Madera, and Tulare Counties, have a two-fold value—possible lumber production and tourist enjoyment. The total estimated volume of lumber stands is 18,381,000,000 feet B.M., a volume exceeded by only four other aviation areas in the State. The amount of this timber available for cutting is 9,175,750,000 feet B.M. and the 31 mills active in 1945 cut 61,777,000 feet B.M.—2.73 percent of the State total. (From Table 23)

The large forests will influence any master airport plan to the extent that greater facilities are needed by visitors to the forests and parks, and additional airport sites are required by the Federal and State forestry services. A summary of the needs of the forestry services follows:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 6 by Counties

Madera County

1. Class 1 at Raymond—State Division of Forestry.
2. Class 1 at Ahwahnee—State Division of Forestry.
3. Class 2 at Wishon (Bass Lake)—United States Forest Service.

The Division of Forestry will use Wishon (Bass Lake) and Madera as constituted at present.

Fresno County

1. Class 1 at Squaw Valley—State Division of Forestry.
2. Class 1 at Headwaters of Cantua Creek—State Division of Forestry.

The State Division of Forestry will use Chandler Field, Fresno, and Coalinga Municipal in their existing condition. The United States Forest Service will use Chandler Field, Fresno.

Tulare County

1. Class 1 at Taylor Meadow—State Division of Forestry.
2. Class 2 at Badger—United States Forest Service.
3. Class 2 at Springville—United States Forest Service.
4. Class 2 at Tunnel Meadow—United States Forest Service.
5. Class 2 at Monache Meadow—United States Forest Service.

The State Division of Forestry will use Orange Cove, Visalia and Three Rivers as constituted at present and request Class 1 fields at Badger and Springville. Tunnel and Monache are Sub 1 fields at present. The United States Forest Service will use Porterville in present condition.

Kings County

1. Class 1 at Avenal—State Division of Forestry.
- The Division of Forestry will use Hanford as it stands.

Mineral Production

The value of mineral production of the Area constitutes a significant percentage of the California total. The dollar value of mineral production in the Area for

1930, 1935, 1940, and 1945—petroleum and natural gas, a wide variety of base and precious metals, and structural stone—follows:

VALUE OF MINERAL PRODUCTION IN AREA 6

	Mineral Production	Percent of California	Percent of U. S.	Percent Change from Preceding Period
1930				
Fresno	\$2,324,473	.64	.05	-----
Kings	13,105,843	3.58	.27	-----
Madera	675,782	.18	.01	-----
Tulare	253,144	.07	.01	-----
Total	\$16,360,242	4.47	.34	-----
1935				
Fresno	\$30,016,686	11.40	.82	1191.33
Kings	10,580,002	4.01	.29	—19.28
Madera	306,644	.12	.01	—54.62
Tulare	53,911	.02	-----	—78.70
Total	\$40,957,243	15.55	1.12	150.35
1940				
Fresno	\$22,103,968	6.45	.40	—26.36
Kings	13,649,445	3.98	.24	29.01
Madera	110,074	.03	-----	—64.10
Tulare	220,065	.07	.01	308.20
Total	\$36,083,552	10.53	.65	—11.90
1945				
Fresno	\$51,677,246	10.91	-----	133.79
Kings	13,568,174	2.86	-----	— .60
Madera	189,886	.04	-----	72.51
Tulare	256,764	.06	-----	16.68
Total	\$65,692,070	13.87	-----	82.06

Sources: *Minerals Yearbook Review of 1940*, California Division of Mines *Bulletins*, California State Chamber of Commerce.

The mining industry of the area will use airplane service mainly for express shipments of machine parts, oil prospecting in difficult terrain, and rapid transportation in private planes for executives.

Manufacturing

Most of the manufacturing in Area 6 is confined to drying or quick-freezing of perishable farm products. The greater part of San Joaquin Valley's dried fruit is processed in the Area and Fresno has the largest dried fruit packing plant in the world. Raisins from the Area are world famous; in 1945, 189 carloads of dried peaches and 86 carloads of dried prunes were shipped from the district to supply the country's markets.

It will be seen that during the period the value of manufactures for the Area increased although the value for the State, as a unit, decreased.

The actual value of goods manufactured in the Area during 1929 and 1939 follows:

VALUE OF MANUFACTURES IN AREA 6

	1929		1939	
	Value of Manufactures	Percent of California	Value of Manufactures	Percent of California
California.....	\$2,950,053,451	100.00	\$2,798,179,523	100.00
Fresno.....	52,404,328	1.78	51,537,293	1.84
Kings.....	7,341,590	.25	9,132,520	.33
Madera.....	3,861,949	.13	3,081,705	.11
Tulare.....	8,053,916	.27	13,339,277	.48
Total of Area 6..	\$71,661,783	2.43	\$77,090,795	2.76

Source: United States Census of Manufacturers.

Tourist and Travel Industry

Area 6 has many tourist attractions—two National Forests, Sierra and Sequoia; three National Parks, Kings Canyon, Sequoia, and Yosemite; one national recreation area, Millerton Lake; and one National Monument, Devil Postpile. These world-renowned beauty spots make up one-third of the total land surface of the Area; and visitors from California, from all over the United States, and from abroad come by thousands each year to view the inspiring and picturesque natural beauties of the area. A comparison of the volume of visitors in 1941 and 1946 shows that in the first postwar year there was already an increased number of tourists. (From Table 16)

VOLUME OF VISITORS TO NATIONAL PARKS AND MONUMENTS—1941 AND 1946

Name	County, Location	Point of Entry	1941	1946
			Number of Visitors	Number of Visitors
Sequoia*	Tulare	Ash Mountain.....	211,440	232,621
		Lost Grove.....	71,568	66,925
		Mineral King.....	13,258	8,488
		Trails.....	3,746	4,522
Totals.....			300,012	312,556
Devil Postpile.....	Madera	Mammoth Lake (Mono County).....	10,241	11,000
King's Canyon*	Fresno-Tulare	Grant Grove (Tulare County).....	172,271	219,976
Millerton Lake† (Friant).....			NA	(Est.) 25,000
Yosemite*	Mariposa	Arch Rock.....	245,421	269,489
	Madera	South Entrance.....	214,853	241,450
	Tuolumne	Big Oak Flat.....	67,806	77,787
		Tioga Pass (Mono County).....	49,170	53,041
		Other Roads.....	16,812	NA
			594,062	641,767
			1,076,586	1,210,299

NA—Not available.
* National parks.† National recreational areas.
Source: Department of the Interior, National Park Service.

The above totals indicate that, with the three exceptions noted, tourists enter these national parks and forests from points within the Area. In the future, many visitors desiring to make the most of their vacation periods will arrive as passengers on regular airlines, will use chartered aircraft, or will fly in their own airplanes. Because of present federal opposition to the location of landing fields within the parks, the airports immediately benefited by this influx of visitors will probably be fields already established.

Distribution and Transportation

As a result of the topography and geographical position of Area 6 primary lines of transportation, both railway and highway, pass directly through the Area.

Main lines of both the Southern Pacific and Atchison, Topeka and Santa Fe Railroads traverse the Area from north to south, connecting the counties in the Area with the rest of the State. The volume of freight shipped by rail has already been partially indicated in the report of the number of carloads of vegetables and fruit shipped from the district annually. This is naturally only a part of the total freight movement from the Area.

An excellent system of highways connects the principal trading centers of the Area with each other and with northern and southern California. Highway No. 99 passes through the center of the Area and numerous branch highways connect outlying districts with the more populous centers. Bus companies provide well

developed passenger service, and much of the local produce is shipped by truck to metropolitan centers.

The present airplane service in the Area will be discussed later.

Indices of Purchasing Power

The indices given in Table 107 bring out two facts clearly: The per capita wealth of the individuals of

Area 6 has been steadily increasing during the last two decades and the per capita wealth in the Area compares favorably with the average of the State.

Aeronautically considered, the high per capita wealth of Area 6 guarantees a high passenger potential for airplane carriers, an expanding market for private plane sales, and a sound basis for financing airport improvements and developments.

TABLE 107
INDICES OF PURCHASING POWER FOR AREA 6
Per Capita Automobile and Truck Registrations^a—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Fresno.....	56,876	.39	108.33	-----	57,905	.40	114.29	2.56
Kings.....	9,528	.38	105.56	-----	10,847	.42	120.00	10.52
Madera.....	6,315	.37	102.78	-----	6,495	.40	114.29	8.10
Tulare.....	30,943	.40	111.11	-----	30,898	.39	111.43	-2.50
Totals.....	103,662	.39	108.33	-----	106,143	.40	114.29	2.56
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Fresno.....	74,628	.42	105.00	5.00	74,273	.34	109.68	-19.05
Kings.....	14,502	.41	103.00	-2.38	13,624	.33	106.45	-19.51
Madera.....	9,404	.40	100.00	-----	8,889	.30	96.77	-25.00
Tulare.....	41,216	.38	95.00	-2.56	40,703	.32	103.23	-15.79
Totals.....	139,750	.41	103.00	2.50	137,489	.33	106.45	-19.51

Per Capita Retail Sales^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Fresno.....	\$72,961	\$505	89.22	-----	\$59,049	\$406	106.01	-19.60
Kings.....	11,971	472	83.39	-----	10,612	408	106.53	-13.56
Madera.....	5,911	344	60.78	-----	4,329	268	69.97	-22.09
Tulare.....	32,710	422	74.56	-----	24,446	308	80.42	-27.01
Totals.....	\$123,553	\$467	82.51	-----	\$98,436	\$369	96.34	-20.99
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Fresno.....	\$78,420	\$661	143.38	62.81	\$153,148	\$858	116.10	29.80
Kings.....	13,645	388	84.16	-4.90	23,423	666	90.12	71.65
Madera.....	6,984	300	65.08	11.94	13,792	592	80.11	97.33
Tulare.....	35,023	327	70.93	6.17	65,250	609	82.41	86.24
Totals.....	\$134,072	\$390	84.60	5.69	\$255,613	\$743	100.54	90.51

CALIFORNIA AIRPORTS

TABLE 107—Continued
 INDICES OF PURCHASING POWER FOR AREA 6
 Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
 (In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Fresno.....	\$63,004	1.48	\$87,635	1.59	\$138,730	1.93	\$178,992	2.06
Kings.....	10,274	.24	13,763	.25	19,338	.27	24,772	.29
Madera.....	4,113	.10	5,793	.11	11,405	.16	12,919	.15
Tulare.....	26,974	.63	39,498	.72	64,764	.90	81,361	.94
Totals.....	\$104,365	2.45	\$146,689	2.67	\$234,237	3.26	\$298,044	3.44

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Fresno.....	\$106,290	\$595	74.10	\$246,378	\$1,141	83.04	91.76
Kings.....	21,629	615	76.59	48,523	1,189	86.54	93.33
Madera.....	12,152	521	64.88	28,334	959	69.80	84.07
Tulare.....	58,134	543	67.62	156,296	1,227	89.30	125.97
Totals.....	\$198,205	\$576	71.74	\$479,531	\$1,159	84.35	101.22

Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Fresno.....	\$211,437,014	\$1,464	81.47	-----	\$197,877,855	\$1,361	124.98	—7.04
Kings.....	44,248,847	1,743	96.99	-----	44,368,685	1,706	156.66	—2.12
Madera.....	31,055,131	1,809	100.67	-----	27,226,305	1,683	154.55	—6.97
Tulare.....	98,074,641	1,266	70.45	-----	83,743,686	1,054	96.79	—16.75
Totals.....	\$384,815,633	\$1,456	81.02	-----	\$353,216,531	\$1,323	121.49	—9.14
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Fresno.....	\$270,462,680	\$1,515	146.66	11.32	\$351,340,500	\$2,417	172.15	59.54
Kings.....	107,982,330	3,070	297.19	79.95	85,352,740	3,283	233.83	6.94
Madera.....	28,606,239	1,227	118.78	—27.10	35,264,774	2,180	155.27	77.67
Tulare.....	89,866,644	839	81.22	—20.40	113,427,935	1,428	101.71	70.20
Totals.....	\$496,917,893	\$1,444	139.79	9.15	\$585,385,949	\$2,193	156.20	51.87

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Population

An examination of Table 108 shows that the population of Area 6 has increased at a steady rate comparable with the growth of population in the State as a whole. It is estimated that in 1950 and 1955 the increase for the area will be slightly greater than the State-wide

increase. Table 109 gives the population growth from the beginning of the century to the present for the cities, municipalities, and unincorporated cities of the Area. An expanding and denser population can only result in increasingly more airplane passengers and more private airplane owners.

TABLE 108
POPULATION OF AREA 6 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930				1945			
Fresno.....	144,379	2.54		Fresno.....	216,000	2.38	20.96
Kings.....	25,385	.45		Kings.....	40,800	.45	16.01
Madera.....	17,164	.30		Madera.....	29,550	.33	26.75
Tulare.....	77,442	1.37		Tulare.....	127,400	1.40	18.90
Total Area 6.....	264,370	4.66		Total Area 6.....	413,750	4.56	20.21
1935				1950			
Fresno.....	145,360	2.39	.73	Fresno.....	240,200	2.42	11.20
Kings.....	26,000	.43	2.42	Kings.....	45,700	.46	12.00
Madera.....	16,175	.27	5.76	Madera.....	32,750	.33	10.83
Tulare.....	79,435	1.30	2.57	Tulare.....	142,200	1.43	11.62
Total Area 6.....	266,970	4.39	.98	Total Area 6.....	460,850	4.64	11.38
1940				1955			
Fresno.....	178,565	2.58	22.84	Fresno.....	270,600	2.44	12.66
Kings.....	35,168	.51	35.26	Kings.....	51,450	.46	12.58
Madera.....	23,314	.34	44.14	Madera.....	36,750	.33	12.21
Tulare.....	107,152	1.55	34.89	Tulare.....	160,100	1.44	12.59
Total Area 6.....	344,199	4.98	28.93	Total Area 6.....	518,900	4.67	12.60

Source: Same as Table 93, Page 244.

TABLE 109
POPULATION STATISTICS OF AREA 6
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 6.....		72,472	135,695	222,044	264,370	344,199	†490,400	
Fresno County.....		37,862	*75,657	128,779	144,379	178,565	†250,000	
Clovis.....	1912			1,157	1,316	1,626	2,213	May 3, 1946
*Coalinga.....	1906		4,199	2,934	2,851	5,026		
Firebaugh.....	1914				506	704		
Fowler.....	1908		675	1,528	1,171	1,531		
*Fresno.....	1885	12,470	24,892	45,086	52,513	60,685	63,672	April 27, 1945
Kerman.....	1946					375		
Kingsburg.....	1908		634	1,316	1,322	1,504		
Mendota.....	1942					1,100		
Parlier.....	1921				564	776		
*Reedley.....	1913			2,447	2,589	3,170		
*Sanger.....	1911			2,578	2,967	4,017	5,217	May 21, 1946
San Joaquin.....	1920				163	240		
*Selma.....	1892	1,083	1,750	3,158	3,047	3,667	5,894	Sept. 14, 1946

TABLE 109—Continued
POPULATION STATISTICS OF AREA 6
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Kings County		9,871	*16,230	22,031	25,385	35,168	†47,000	
Coreoran	1914			1,101	1,768	2,092	2,828	Nov. 19, 1946
*Hanford	1891	2,929	4,829	5,888	7,028	8,234	9,989	Nov. 27, 1946
Lemoore	1900		1,000	1,355	1,399	1,711		
Madera County		6,364	8,368	12,203	17,164	23,314	†34,400	
Chowchilla	1923				847	1,957		
*Madera	1907		2,404	3,444	4,665	6,457		
Tulare County		18,375	35,440	59,031	77,442	107,152	†159,000	
*Dinuba	1906		970	3,400	2,968	3,790	4,468	June 10, 1946
*Exeter	1911			1,852	2,685	3,883	4,279	Nov. 7, 1946
*Lindsay	1910		1,814	2,576	3,878	4,397	5,137	Jan. 21, 1946
*Porterville	1902		2,696	4,097	5,303	6,270	6,827	Mar. 29, 1946
*Tulare	1888	2,216	2,758	3,539	6,207	8,259	9,376	April 6, 1944
*Visalia	1874	3,085	4,550	5,753	7,263	8,904		
Woodlake	1939					1,146		

* URBAN—1940.

† Estimate of California Taxpayers' Association.

* Part of Fresno County annexed to Kings County in 1909.

Unincorporated Places

	Popula- tion		Popula- tion
Fresno County		Madera County	
Auberry	100	Bellevue	100
Big Creek	350	Coarsegold	250
Biola	225	North Fork	300
Calwa	225	Raymond	125
Carruthers	125		
Centerville	200	Tulare County	
Del Ray	625	Alpaugh	638
Easton	350	California Hot Springs	300
Figarden	125	Cutter	917
Friant	1,137	Ducor	125
Helm	175	Earlimart	1,774
Kearney Park	125	Farmersville	1,296
Laton	712	Goshen	115
Malaga	790	Ivanhoe	814
Oilfields	400	Johnson Tract	1,608
Orange Cove	555	Lemoncove	250
Pinedale	510	Orosi	1,225
Riverdale	400	Pixley	1,625
Tranquility	200	Plano	125
		Poplar	250
Kings County		Richgrove	175
Armona	1,134	Sequoia National Park	125
Avenal	3,786	Springville	400
Grangeville	200	Strathmore	500
Guernsey	150	Sultana	250
Hardwick	556	Tagus	250
Kettleman City	400	Terra Bella	300
Murray	100	Tipton	500
Odessa	175	Traver	150
Stratford	450	Woodville	200
		Yettem	200

Source: 1940 Census or later semi-official estimates from Roster, Public Officials of California, Secretary of State.

All of these economic factors indicate that Area 6 will take a foremost place in the aeronautical development of California. Its agricultural specialties make an impressive air freight potential. Its growing population and increasing wealth indicate a lively market for

private airplanes. Its increasing population and the thousands of tourists will make a high airplane passenger potential. The possibilities of this development will now be discussed in detail.

AERONAUTICAL APPRAISAL

At the present time Area 6 has a relatively high proportion of operating airports because it is primarily composed of flat terrain, limited to physical obstructions of mountains and hills in the northeast and southwest, thereby providing unrestricted natural airways to both ends of the San Joaquin Valley Basin. The full utilization of these airports with a maximum incidence of safety is not possible inasmuch as many

of them do not meet the recommended standards of the Civil Aeronautics Administration relative to windage, length of runways and other technical characteristics. Many of these airports have an unexplored business potential because of a lack of adequate facilities for private planes as well as for commercial passengers and air freight. Listed below are the known existing airports in the Area :

Plate M-6 Code	City and Airport Name	Ownership	Class
MADERA COUNTY			
6-20	Bass Lake (Wishon)	U. S. F. S.	S-1
6-45	Madera Municipal	City of Madera	4
FRESNO COUNTY			
6-1	Huron—Huron Aux.	U. S. W. A. A.	2
6-2	Huron—Indian Aux.	U. S. W. A. A.	2
6-3	Huron—West Aux.	U. S. W. A. A.	2
6-4	Helm—Helm Aux.	U. S. W. A. A.	2
6-25	Fresno—Hammer	City of Fresno	6
6-26	Fresno—Chandler	City of Fresno	3
6-27	Coalinga	City of Coalinga	S-2
6-28	Dos Palos—Eagle	City of Dos Palos	1
6-50	Dos Palos—Ora Loma	Commercial-Private	S-2
6-51	Fresno—Adams	Commercial-Private	2
6-52	Fresno—Belmont	Commercial-Private	S-2
6-53	Fresno—Cannon	Private	1
6-54	Fresno—Furlong	Commercial-Private	S-2
6-55	Fresno—Sierra Sky Park	Private	2
6-56	Fresno—Sky Lark	Commercial-Private	2
6-57	Kerman—Bland	Commercial-Private	1
6-58	Parlier—Intercity	Commercial-Private	S-2
6-59	Reedley—Gt. Western	Commercial-Private	1
6-60	Selma—Norsigian	Commercial-Private	S-2
6-61	Selma—Palomino	Private	1
6-62	Selma—Kleinhammer	Private	S-1
6-63	Westhaven—Boston Land	Private	S-2
TULARE COUNTY			
6-10	Monache Meadows	U. S. F. S.	S-1
6-11	Templeton Meadows	U. S. F. S.	S-1
6-12	Tunnel Meadows	U. S. F. S.	S-1
6-13	Kern Canyon	U. S. F. S.	S-1
6-31	Tulare Airpark	County of Tulare	1
6-32	Tulare—Rankin Academy	County of Tulare	1
6-33	Visalia	City of Visalia	5
6-34	Visalia—Sequoia	County of Tulare	1
6-35	Porterville	City of Porterville	5
6-36	Three Rivers	County of Tulare	S-1
6-64	Dinuba—Alta	Commercial-Private	2
6-65	Exeter—Lindsey	Commercial-Private	1
6-66	Lindsey—Colburn	Commercial-Private	S-2
6-67	Lindsey—Pruner	Private	S-1
6-68	Porterville—Fuller	Private	S-2
6-69	Strathmore—Traugher	Commercial-Private	1
6-70	Visalia—Green Acres	Commercial-Private	S-2
6-71	Visalia—Piepgrass	Commercial-Private	1
6-72	Woodlake	Commercial-Private	S-2
6-73	Woodville—Vossler	Private	1
6-74	Richgrove—Burum	Private	S-1

<i>Plate M-6 Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
KINGS COUNTY			
6-13	Summit Lake Aux.-----	U. S. W. A. A.-----	2
6-14	Murray Aux.-----	U. S. W. A. A.-----	3
6-45	Hanford Municipal-----	City of Hanford-----	1
6-46	Lemoore Municipal-----	City of Lemoore-----	4
6-80	Avenal-----	Private-----	S-2
6-81	Corcoran-----	Commercial-Private-----	S-2
6-82	Corcoran—Salyer Farms-----	Commercial-Private-----	2
6-83	Corcoran—Van Glahn-----	Commercial-Private-----	2
6-84	Corcoran—Bean-----	Commercial-Private-----	
6-85	Lemoore—Kleinhammer-----	Private-----	S-1
6-86	Lemoore—Terra-----	Private-----	S-2
6-87	Kettleman City-----	Private-----	S-1
6-88	Stratford—Newton-----	Private-----	1

Scheduled air transport into Area 6 started as early as September, 1926, when Pacific Air Transport made Fresno an intermediate stop on the Los Angeles-Seattle flights, followed by Maddux Air Lines, with stops at Bakersfield and Fresno, as part of their Los Angeles-San Francisco service.

Currently there are three airlines with stops in Area 6: Trans World Airlines, with eight daily in and out flights at Fresno on the trips between Los Angeles and San Francisco; United Airlines with four daily in and out flights at Visalia on their skip-stop schedules and twenty in and out daily flights at Fresno on their run between Los Angeles and San Francisco with intermediate stops at Bakersfield, Modesto, Sacramento and Oakland (these flights include four in and out air freight flights); and Southwest Airways with eight in and out flights stopping at Coalinga on their coastal cities feeder service between Los Angeles and San Francisco.

These flights link this Area with the major trading areas in the State, the far northern counties by connecting flights at San Francisco and Sacramento and the southern counties by connecting flights at Los Angeles. Direct connection is also possible at these major terminals to all points within the continental United States, Canada, Mexico and seaward to Honolulu and Australia. By air carrier, this rich agricul-

tural section has a business potential of national and international character.

The increase in volume of commercial air activity in this Area is indicated by the following tables of operations at Chandler Field, Fresno:

COMMERCIAL AIR LINES PASSENGERS

	<i>On</i>	<i>Off</i>	<i>Through</i>
1938-----	2,737	2,535	14,184
1939-----	2,650	2,573	18,180
1940-----	5,180	5,143	26,695
1941-----	6,290	6,643	37,889
1942-----	6,239	5,410	38,443
1943-----	5,887	5,260	37,792
1944-----	3,423	3,245	53,945
1945-----	6,647	6,004	57,224

The annual total pounds of air mail dispatched from the City of Fresno Post Office reveals the increased utilization of air carriers:

1935-----	23,527 lbs.	1940-----	47,515 lbs.
1936-----	31,523 lbs.	1944-----	157,998 lbs.
1937-----	37,351 lbs.	1945-----	154,969 lbs.
1938-----	39,834 lbs.	1946-----	547,660 lbs.*
1939-----	56,583 lbs.		

* Based on 9 months' mailings.

The advantages to be derived from the speed of the airplane will be the factors determining the specific traffic likely to become available to air transportation.

ESTIMATES OF SCHEDULED AIR TRAFFIC

Using the historical statistics of commercial air service operating out of Chandler Field at Fresno, and correlating the in and out schedules to the in and out passengers, the utilization of air line seat use is approximately three per scheduled flight. Apportioning the projected 1950 California passenger movements to the population within the 25 mile radii of Coalinga, Fresno, and Visalia and applying the indicated interest factor of the population in air travel, Area 6 can expect an annual commercial air passenger load of 64,355 in 1950 and 93,989 in 1955. Resolving these figures into daily schedules, the Area will need approximately 30 in and

out flights per day in 1950 and 43 per day in 1955. This number of flights would service passengers as follows:

<i>Air Line Stop</i>	<i>Annual On and Off Passengers</i>	
	<i>1950</i>	<i>1955</i>
Coalinga-----	1,414	2,054
Fresno-----	31,117	45,197
Visalia-----	31,824	46,738
Total-----	64,355	93,989

Increasing use of air transportation undoubtedly will dictate the development of additional commercial service airports. At the present time Madera and

Porterville have good basic facilities that could accommodate feeder line service, and also provide additional shipping points for air freight. Although these two locations would probably draw the majority of their passengers and shipments from the potential computed for the Area, their immediate accessibility would likely generate additional traffic that would not otherwise be attracted to air transportation. Hanford is also being

considered as a feeder line stop but would require a Class 3 facility in place of the present Class 1 Hanford Municipal Airport.

The agricultural production of this Area is of such a nature that it could benefit greatly from immediate marketing provided by air freight shipment. Analyzing the 1945 quantity and type of shipment, the following potential for air freight has been developed:

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢ †	Tons	Percent @ 5¢ †	Tons
Fresno.....	Asparagus.....	6	72	15	10.8	28	20.2
	Broccoli.....	45	540	0	-----	5	27.0
	Cantaloupes.....	3,439	37,829	2	756.6	8	3,026.3
	Casabas.....	13	143	0	-----	2	2.9
	Grapes.....	7,570	128,690	1	1,286.9	5	6,434.5
	Honeydew Melons.....	265	2,915	0	-----	2	58.3
	Lettuce and Romaine.....	363	4,356	6	261.4	18	784.1
	Mixed Deciduous Fruit.....	48	672	2	13.4	8	53.8
	Mixed Melons.....	268	2,948	0	-----	2	59.0
	Mixed Vegetables.....	42	504	0	-----	6	30.2
	Peaches.....	1,236	14,832	7	1,038.2	23	3,411.4
	Peas, Green.....	104	1,040	3	31.2	17	176.8
	Persian Melons.....	125	1,375	0	-----	2	27.5
	Plums and Fresh Prunes.....	671	10,065	1	100.7	13	1,308.5
	Tomatoes.....	138	1,794	23	412.6	43	771.4
	Totals.....	14,333	207,775	-----	3,912	-----	16,192
Kings.....	Apricots.....	2	30	2	.6	8	2.4
	Cantaloupes.....	149	1,639	2	32.8	8	131.1
	Grapes.....	402	6,834	1	68.3	5	341.7
	Honeydew Melons.....	176	1,936	0	-----	2	38.7
	Peaches.....	111	1,332	7	93.2	23	306.4
	Persian Melons.....	7	77	0	-----	2	1.5
	Totals.....	847	11,848	-----	195.0	-----	822.0
Madera.....	Cantaloupes.....	31	341	2	6.8	8	27.3
	Grapes.....	108	1,836	1	18.4	5	91.8
	Peaches.....	20	240	7	16.8	23	55.2
	Peas, Green.....	15	150	3	4.5	17	25.5
	Tomatoes.....	41	533	23	122.6	43	229.2
	Totals.....	215	3,100	-----	169.0	-----	429.0
Tulare.....	Cabbage.....	1	12	2	.2	7	.8
	Cantaloupes.....	68	748	2	15.0	8	59.8
	Casabas.....	15	165	0	-----	2	3.3
	Cauliflower.....	20	240	0	-----	6	14.4
	Celery.....	304	3,648	0	-----	7	255.4
	Cucumbers.....	1	11	2	.2	13	1.4
	Grapes.....	6,784	115,328	1	1,153.3	5	5,766.4
	Honeydew Melons.....	295	3,245	0	-----	2	46.9
	Lettuce and Romaine.....	140	1,680	6	100.8	18	302.4
	Mixed Deciduous Fruit.....	7	98	2	2.0	8	7.8
	Mixed Melons.....	25	275	0	-----	2	5.5
	Mixed Vegetables.....	2	24	0	-----	6	1.4
	Peaches.....	493	5,916	7	414.1	23	1,360.7
	Peas, Green.....	18	180	3	5.4	17	30.6
	Persian Melons.....	1	11	0	-----	2	.2
	Plums and Fresh Prunes.....	787	11,805	1	118.1	13	1,534.7
	Tomatoes.....	158	2,054	23	472.4	43	883.2
	Totals.....	9,119	145,440	-----	2,282.0	-----	10,275.0
	Area Total.....	24,514	368,163	-----	6,558.0	-----	27,718.0

Source: * California Carlot Shipments, Fruits and Vegetables, 1945.
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., Air Cargo Potential in Fresh Fruits and Vegetables, Wayne University Press, Detroit, Michigan, 1944.

Consolidating this information and translating it into actual plane schedules, the following resolve is effected:

Averaging between the projected DC-3 and DC-4 schedules, expected maximum daily in and out air freight flights would be 12 in 1950 and 49 in 1955.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES—AREA 6

	Days in Normal Growing Season*	Perishable Air Freight Potential (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total.....		6,558	2,623	19	578	4
Fresno.....	289	3,912	1,565	10.83	345	2.39
Kings.....	256	195	78	.61	17	.13
Madera.....	243	169	67	.55	15	.12
Tulare.....	264	2,282	913	6.92	201	1.52
1955 Total.....		27,718	11,087	80	2,442	18
Fresno.....	289	16,192	6,477	44.82	1,427	9.88
Kings.....	256	822	329	2.57	72	.56
Madera.....	243	429	171	1.41	38	.31
Tulare.....	264	10,275	4,110	31.14	905	6.86

* Source: *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

To assure adequate passenger and freight service, it is estimated that sufficient airport facilities must be provided to serve 42 commercial in and out flights per day in 1950 and 92 similar flights in 1955.

The full use of air carriers will be realized only if airport facilities are sufficiently close to the point of origin of passenger and freight traffic so that travel

time and accessibility will not offset the time saving of air transportation.

The areas suggested for commercial development are Madera (Madera County); Fresno, Coalinga and Reedley (Fresno County); Visalia and Porterville (Tulare County); and Lemoore (Kings County).

PRIVATE FLYING ESTIMATES

Based upon a combination of economic buying potential and current private plane per capita ownership, the anticipated private plane ownership for 1950 and 1955 in Area 6 will be distributed as follows:

County	Index	Private Plane Ownership	
		1950	1955
Madera	61	38	89
Fresno	106	491	1,146
Tulare	117	321	746
Kings	118	103	244
Total		953	2,220

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in the Non-Scheduled Aviation Projection, Part V.

MADERA COUNTY

Township	Percent	1950	1955
2	24.39	9	22
3	67.52	26	60
4	3.05	1	3
5	5.04	2	4

FRESNO COUNTY

Township	Percent	1950	1955
1	2.00	10	23
2	3.09	15	35
3	70.18	345	804
4	1.86	9	21
5	3.32	16	38
6	3.55	17	41
7	2.94	15	34
8	3.74	18	43
9	1.37	7	16
10 .....	.35	2	4
11	1.48	7	17
12 .....	.43	2	5
13 .....	.48	2	6
14 .....	.62	3	7
15 .....	.83	4	10
16 .....	.38	2	4
17	1.26	6	14
18	2.12	11	24

KINGS COUNTY

Township	Percent	1950	1955
Avenal	15.42	16	38
Corcoran	15.06	16	37
Hanford	51.47	53	125
Lemoore	18.05	18	44

TULARE COUNTY

<i>Township</i>	<i>Percent</i>	<i>1950</i>	<i>1955</i>
Alila -----	2.95	9	22
Alpaugh -----	.51	2	4
Dinuba -----	8.78	28	65
Ducor -----	2.57	8	19
Exeter -----	5.86	19	44
Lemon Cove -----	3.69	12	27
Lindsay -----	6.01	19	45
Orosi -----	2.66	9	20
Porterville -----	15.90	51	119
Strathmore -----	2.35	8	17
Tipton -----	2.13	7	16
Tulare -----	17.55	56	131
Visalia -----	29.04	93	217

AIRPORT REQUIREMENTS

FRESNO COUNTY

Coalinga

Coalinga lies in the southwestern corner of the County on the edge of Blue 46 Civil Airway. The population of over 5,000 is engaged in agriculture and oil production. It is estimated that the township will have 17 private owners of aircraft in 1950 and 41 in 1955. There is also the possibility of substantial air cargo development. The existing municipal Class S-2 airport has proved poorly located and a new site has been selected. It is recommended that a Class 3 facility be constructed here by 1950 to meet local private flying needs, handle air freight, and serve adequately the feederline operation which is now utilizing the field.

Dinkey Creek-Shaver Lake

There are several small communities in this region which is devoted principally to agriculture and lumbering, and it is anticipated that there will be a minimum of 11 private aircraft by 1950 and 24 by 1955. It is advisable that the district have a Class 1 airport by 1950 to accommodate local airplanes. This section also has great recreational possibilities and an airport facility would doubtless hasten its development. The forestry services should find a facility here of assistance in their fire patrol.

Selma

Selma, a city in the south central part of the County, lies in a trading area of some 8,300 persons. Parlier, a short distance to the northwest, has an immediate trading area of 2,500, while Reedley, southeast of Parlier, serves a market district of 9,700. All three cities are located in a rich agricultural district specializing in grapes and peaches. The surrounding townships are expected to have 37 private aircraft by 1950 and 88 by 1955. The district is served at present by two private Class S-2 airports. It is recommended that a Class 3 facility be developed at Selma by 1950 to handle non-scheduled and cargo operations for this entire district. An airport at this site would be approximately 15 air miles from the proposed cargo carrier facility at Orange Cove.

Principal airport needs of Area 6 are installations to improve the overall coverage of facilities for the safety and convenience of non-scheduled operation, adequate airport bases for forest patrol and fire protection, and airports to provide access for air travelers to the many important recreational sections of the Area. The following recommendations are designed to fulfill these requirements.

Firebaugh-Mendota

Firebaugh, with 704 inhabitants, and its unincorporated neighbor, Mendota, with 1,100 residents, are situated in the northwestern corner of Fresno County, in the center of a region famous for its melons. It is believed this township will have 10 private aircraft owners in 1950 and 23 in 1955. A Class 1 facility is indicated for the area by 1950 at a site convenient to the two towns. Such an airport would not only service non-scheduled aviation, but give the County better overall airport coverage in this section. If the site is well chosen, consideration could be given in the future to expansion should air freight potentials warrant.

KINGS COUNTY

Avenal

Avenal is a town of 3,786 residents, most of whom are engaged in oil producing. It lies in the western corner of Kings County just off Blue 46 Civil Airway. It is estimated that the township will have 16 private aircraft by 1950 and 38 by 1955. The County has declared the existing private Class S-2 facility inadequate and the State Forestry Service has expressed an interest in an airport at this site. The 1947 National Airport Plan has the development of the existing airport to full standard Class 2 under consideration and the project is pending in the 1947 Program. The present study concurs that this improvement is necessary and believes it should be completed by 1950.

Hanford

Hanford, the county seat of Kings County, lies in the north central part of the County, 22 miles west of Visalia. It is situated almost midway between Los Angeles and San Francisco, on the main airway—Amber 1. The population of 8,234 is mainly engaged in agriculture. It is predicted that the township will develop 53 private airplane owners by 1950 and 125 by 1955. The existing site of the municipal Class 1 facility has proved inadequate and is to be converted into a fair grounds. A new location has been chosen west of town. Proposals for constructing a Class 2 airport here are contained in the 1947 National Airport

Plan and Program. Hanford is well located to serve as a feederline stop in the future, and the County should have a facility in this location to handle potential air cargo. It is believed that a Class 3 airport at Hanford by 1950 is justified by the possibility of scheduled service and the indicated cargo and private flying potentials.

Kettleman City

Kettleman is a small town in the western part of the County, about 10 air miles east of the proposed development at Avenal. At present there is a private substandard Class 1 facility, at this location on Blue 46 Civil Airway. It is advisable that a Class 1 airport be developed here by 1950 to give the County better airport coverage and serve as an emergency landing field, since Kettleman City is separated from Avenal by the Kettleman Hills.

Lemoore

Lemoore lies in the north central portion of the County and is about 8 miles southwest of Hanford. Agriculture is the principal source of income for the local population of 1,711. The private aircraft of the township are expected to number 18 in 1950 and 44 in 1955. The 1947 National Airport Plan includes the development to full standard specifications of the existing private Class S-1 Kleinhammer Field. The city has expressed its willingness to sponsor this improvement. Lemoore's Municipal Airport is more than 9 miles from the city and a facility only 1 mile distant would stimulate private flying activities. It is therefore recommended that Kleinhammer Field be raised to full Class 1 standard by 1950 under city sponsorship.

MADERA COUNTY

Bass Lake

The United States Forestry Service at present has a substandard facility in this remote district in the north central part of the County and has expressed a desire to have the facility improved to Class 2 standards. This area has considerable recreational possibilities which could be developed much more rapidly with better transportation. The site is also close to the southern entrance to Yosemite National Park and an adequate facility here could serve tourists flying in at this point, as well as serve emergency landing purposes. It is believed that a Class 2 airport at Bass Lake by 1950 is justified for the reasons cited.

Chowchilla

Chowchilla, with a population of 1,957 according to the last census, is located near the northern boundary of the County, about halfway between Merced and Madera, on Blue 10 civil airway. It is estimated that the township will have 9 private aircraft in 1950 and 22 in 1955. It is recommended that a Class 1 facility be considered for this location by 1955. The local airplane

ownership by that date would justify an airport and a facility here would provide the County with better coverage and prove valuable to non-scheduled aviation for emergency landing purposes.

TULARE COUNTY

Badger

The proposed location at Badger is recommended for development by the United States Forest Service, in which this study concurs because of its value as a point of access to General Grant Grove of Big Trees and all of the mountain recreational areas of Kings Canyon National Park, to which there were 219,976 visitors in 1946 (see Table 16). In keeping with the policy of making California's National Parks and recreational areas accessible to the air traveler and also to supply the need of the forest service, the development of a Class 2 facility at Badger is recommended by 1950.

Exeter-Lindsay

These neighboring cities are located southeast of Visalia in the center of the richest section of Tulare County, and have always been noted for the air-mindedness of their citizenry. In addition to the highly developed agricultural activities of the neighborhood, there is the important tourist travel to the mountain resorts to which they are the gateway, to be considered in planning airport facilities here. While several substandard private airports exist in the general locality, these cities and the County of Tulare are interested in the establishment of a Class 1 airpark to serve the aeronautical interests mentioned above. Existing facilities are considered too remote to adequately serve the community, and the 1947 National Airport Plan considers construction of an airport at a new site in the vicinity advisable. This development is believed desirable for 1950 for the purposes of this report. The Tulare County Planning Commission considers this airport desirable for future expansion to a size suitable for cargo operation.

Lemon Cove-Woodlake

Woodlake lies in the north central portion of Tulare County fourteen miles northeast of Visalia in a region of high agricultural productivity. The section's airport requirements are presently served by a private Class S-2 airport and the 1947 National Airport Plan includes development to a standard Class 2 facility at this location, which this study feels desirable by 1950. The private airplane ownership potential is estimated at 25 for the year 1950 and this will be greatly augmented by crop dusting in the locality and by visitors to the recreational area adjacent on the east.

Monache

This natural airport, a United States Forest Service Class Sub-1 facility, is located high in the Sierra Nevada Mountains and has been used for a period of years by hunters and fishermen for aerial access to a remote mountain region. A moderate amount of improvement

has been completed in the past by the Forest Service who use the field for access to ranger stations and for aerial patrol base. While there is no local justification for the airport, its value for recreational purposes is unsurpassed and the development of runways to Class 2 standards for an altitude of 8,000 feet is urgently recommended by 1950. A similar request has been made by the United States Forest Service.

Orange Cove

Orange Cove is situated in northwest Tulare County in the foothills of the Sierra Nevada Mountains in one of the fog-free locations of the Central Valley. It is in the center of a rich agricultural region in the County which ranks second in the United States in the value of agricultural products. The 1947 National Airport Plan and Program propose the establishment of a Class 1 county owned airport here, in which this study concurs. However, ultimate development to Class 3 standards is recommended by 1955 because of a high air freight potential in the locality. The nearest airport suitable for air freight is that which has been recommended for construction in the vicinity of Selma, Fresno County. The private airplane ownership potential for the township is 9 in 1950 and 20 in 1955. The vineyards and orchards of this region require aerial spraying and dusting which also indicates the need for this proposed development.

Pixley

Pixley is located adjacent to Highway 99 in the south central section of Tulare County. It is approximately fifteen miles south of Tulare and a similar distance north of Delano in Kern County, the nearest existing airports. Its service area includes a population of approximately 10,000. There is a local 1955 aircraft ownership potential of 22. Development of a public Class 1 airport at this location is included in the 1947 National Airport Plan and Program, which is considered desirable by 1950 for the purposes of this report.

Springville

The town of Springville, located in the southeastern section of Tulare County, affords access to a mountain area rich in recreational facilities. While its local population could not possibly justify an airport at this location, the needs of the United States Forest Service and the tourist potential from all over California are recognized in the recommendation for a Class 2 installation here by 1950.

Taylor Meadow

This site is located in the extreme southeastern section of Tulare County, high in the Sierra Nevada Mountains, approximately ten miles north of the Walker Pass highway, the route of which forms a natural airway between San Joaquin Valley and desert points. A proposed Class 1 facility at this location is recommended by the California Division of Forestry and would serve the dual purpose of forest protection and an emergency facility for non-scheduled aviation on a natural airway; for these reasons it is believed development should be planned for 1955.

Three Rivers

Three Rivers is located in the rugged mountain section of east central Tulare County, on the principal highway into Sequoia National Park, famous the world over for its primitive mountain scenery and recreational resorts, which entertained 312,556 visitors in 1946 (see Table 16). Development of this location is in the 1947 National Airport Plan and Program and is justified as a tourist facility, as an adjunct to the protection of the national forest and as an emergency landing field in a mountain area. It should be developed to Class 2 standards by 1950.

Tulare Airpark

The development of the existing county-owned Class 1 airport here to a full Class 2 installation by 1950 is recommended in the Tulare County Airport Plan and included in the 1947 National Airport Plan and Program. Work is already under way in this development. It is justified by a private plane ownership potential of 63 in 1950 and 147 in 1955. The Airpark is ideally situated on Highway 99, three miles south of the city. The proposed plan is presented elsewhere in this report as an example of the type of airpark planning recommended for similar developments in small cities throughout the State.

Tunnel Meadows

As in the case of Monache, the Tunnel Meadows substandard Class 1 airport is also used for aerial access to a primitive area and for similar reasons its development to Class 2 standards of runway length is recommended by 1950. The altitude is 9,100 feet and a Class 2 airport is believed to be the minimum standard which will render regular use of this airport feasible for current models of private aircraft.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 6

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Fresno County							
Coalinga		Municipal	S-2	3	FE,C,NS		
Dinkey Creek-Shaver Lake				1	NS,FS,R		
Firebaugh-Mendota				1	NS		
Selma		Private	S-2	3	NS,C		
Kings County							
Avenal		Private	(S-2)	2	NS,FS		
Hanford		Municipal	1	3	FP,NS,C		
Kettleman City				1	NS		
Lemoore	Kleinhammer	Private	S-1	1	NS		
Madera County							
Bass Lake		USFS	S-1	2	FS,R		
Chowchilla						1	NS
Tulare County							
Badger				2	FS,NS,R		
Exeter-Lindsay		Private	1	1	NS,R (New)		
Woodlake-Lemon Cove		Private	S-2	2	NS,R		
Monache		USFS	S-1	2	FS,NS,R		
Orange Cove				2	NS	3	NS,C
Pixley				1	NS		
Springville				2	FS,NS,R		
Taylor Meadow						1	FS,NS
Thrice Rivers		County	S-1	2	FS,NS,R		
Tulare	Tulare Airpark	County	1	2	NS		
Tunnel Meadows		USFS	S-1	2	FS,NS,R		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

APPENDIX 7

AREA 7—INYO-MONO REGION

NATURAL CHARACTERISTICS

Area 7 is comprised of Inyo, Mono and Alpine Counties, and ranks third largest of the California aviation areas.

Geography and Topography

The Inyo-Mono Area lying along the central eastern border of the State, adjoins Nevada for a distance of more than 300 miles; Kern and San Bernardino Counties lie to the south; Tulare, Fresno, Madera, Mariposa, Tuolumne, Calaveras and Amador Counties bound the west and El Dorado County borders the north and west. The western boundary of this Area follows the summit of the Sierras. Along this crest are eleven snow-capped granite peaks exceeding 14,000 feet in elevation and one, Mt. Whitney, with a height of 14,496 feet, is the highest mountain in the United States. The ultimate in contrasts is found within 75 miles where Death Valley lies 279 feet below sea level. This Area lies almost totally on the east slope of the High Sierras and presents startling topographical contrasts that can be found nowhere else.

Hundreds of small streams start near the Sierra divide, and form a remarkable feature of this Area—its hundreds of mountain lakes. This watershed is the source from which the City of Los Angeles receives its water supply through a 250 mile aqueduct. Alpine County is the source of the Carson River which flows eastward into Nevada.

Land Usage

The generally mountainous terrain and climatic extremes are not favorable for agriculture, mining or

manufacturing and as a result the economic status of the area is almost wholly dependent on recreational facilities. The extent of this dependability is reflected in the land usage table shown below (From Table 15).

Land used for crops.....	15,278 acres
Idle cropland and arable pasture.....	52,634 acres
Woodland	183,413 acres
Other Private Land.....	632,360 acres
 Total privately owned land.....	 883,685 acres
National Parks and Forests.....	4,129,801 acres
Other Public Lands.....	3,856,274 acres
 Total public lands.....	 7,986,075 acres

Climate

The greatest extremes in California's climate are found in this Area. Subzero temperatures at the higher elevations to 134° on the floor of Death Valley have been recorded. At Tamarack, 8,060 feet elevation, rainfall averages 44 inches annually. January temperatures range from 12° to 39° and July temperatures vary between 42° to 74°. Greenland Ranch, 178 feet below sea level, has an average rainfall of 1.58 inches. Here, January temperatures range from 38° to 65° and July temperatures vary from 88° to 116°. This wide scope of climatic factors does less to detract from the Area's aeronautical importance than might be expected. On the contrary, the propinquity of such divergent extremes has contributed to the Area's widely known scenic and recreational potentialities.

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

As noted above, Area 7 has adverse agricultural and manufacturing conditions but future mineral production is more promising. The total Area lies in a highly mineralized belt and contains many known deposits of both metallic and non-metallic minerals. There has been little or no development of many of these products because of their remote situation and lack of transportation facilities. This factor, with the recreational potential added, would indicate that several new airport facilities should be developed at an early date.

Mineral Production

Area 7 includes within its boundaries a highly mineralized region where large saline deposits exist. Gold,

lead, silver and tungsten ore are also present. Unfortunately for mining interests, much of the country is inaccessible. Another major obstacle to the development of these natural resources has been the absence of rail transportation and the comparatively recent development of highways. During the war, tungsten was in great demand and this Area produced the greater part mined in California. More recently demand for tungsten has decreased and mineral production is mainly concentrated in borates, soda and lead. In 1945, the value of minerals produced was \$4,351,678,¹ or 1 percent of the State total. This represents a 23 percent increase over the 1940 value.

¹ State Division of Mines, Department of Natural Resources.

Agriculture

In spite of the small acreage suitable for farms and the short growing season, which averages 40 days in Alpine County, agriculture is the most important source of income for this northern-most section of the Area and amounted to \$251,000 for 1945.¹ Livestock—beef, cattle, and sheep—was the principal product. Mono County, directly south, also derives its principal income from agriculture, limited almost exclusively to livestock. In 1945 this income amounted to \$1,044,000. Inyo County received a cash farm income totaling \$2,648,000 for the same year, chiefly for livestock and livestock products, but this was not the major source of income as in Alpine and Mono Counties.

Timber Resources

In the early days, following the silver mining era, lumbering was an important industry in the Area and millions of board feet were cut in the high country and floated down the rivers. Today, lumbering has virtually disappeared as a commercial enterprise and an extensive program of reforestation is under way to restore the timber resources of the Area.

Total lumber production in 1945 was 4,971,000 board feet or .22 percent of the State total. There remains 1,201,000,000 board feet of which 88 percent is available.² For the proper care and protection of the existing forests and reforestation program, the Federal and States forestry services have asked for the following facilities:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 7 by Counties

Alpine County

None.

Inyo County

1. Class 2 at Big Pine—United States Forest Service.
2. Class 2 at Big Pine (Coyote Meadow)—United States Forest Service.
3. Class 2 at Lone Pine—United States Forest Service.
4. Class 2 at Coso Junction—United States Forest Service. The United States Forest Service will use Bishop Airport in its present condition.

Mono County

1. Class 2 at Leeving—United States Forest Service.

¹ California Crop and Livestock Reporting Service.

² Total volume and amount available from California Forest and Range Experiment Station, *Forest Survey Release No. 4, March 1, 1946.* (Table 23.)

Tourist and Travel Industry

The extreme mountainous terrain, with snow-capped peaks, lakes and streams, large forest areas and dude ranches in the valleys, combine to make this area recreationally attractive to thousands of fishermen, hunters, campers and other vacationists. The mountain lakes and streams abound with trout. In the forest areas grouse, quail, pheasant, and deer are found. The National Forest Administration has preserved large sections of this Area in almost its original condition and kept it interesting to lovers of the out-of-doors. Inyo National Forest alone attracts approximately 300,000 visitors annually to its pine forests, tumbling streams and snow-covered slope. In a recent Forest Service recreational survey for 1946, visitors were classified as follows:

90,000 Fishermen	8,000 Packers
80,000 Campers	5,000 Picknickers
35,000 Resort Guests	21,000 Special Use
20,000 Winter Sportsmen	Permittees
17,000 Hunters	21,000 Miscellaneous Others

In the southeast are the dude ranches and resorts of Death Valley which attract another 100,000 tourists annually.

In view of the already impressive numbers of recreational visitors to this extensive Area, it appears necessary that more private and commercial transport facilities be made available at points within the Area where they are now lacking. To date, no commercial air transportation is scheduled in Area 7 and private flying has generally been restricted to the mild and level Owens Valley. Several applications for scheduled routes, however, have been filed. This fact, combined with the Area's growing recreational importance, points to the need of preparing for future air activity.

Commerce and Transportation

Due to the absence of extensive agricultural and industrial interests, transportation facilities have never been developed beyond the elementary stages heretofore required by recreational travel. There are no main railways, and bus schedules are few. Private vehicles using the Area's 4,524 miles of roads, of which 1,245 miles are surfaced, carry almost the entire load of transportation. U. S. Highway No. 395 runs north and south through Owens Valley; State Highway No. 190 serves east and west traffic across the Death Valley National Monument. The Division of Highways, by actual car count at Crestview, estimated more than 1,000,000 transients passed through the Area in 1946.

Indices of Purchasing Power

While Area 7's position relative to other Areas and to the State as a whole has been low in point of rank, it is interesting to point out that in 1940 it topped all

Areas in *per capita* assessed valuation and maintained second rank in 1945. The indices given in Table 110 point out that per capita retail sales and per capita automobile and truck registrations for 1945 were above the State average.

TABLE 110
INDICES OF PURCHASING POWER FOR AREA 7
Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Alpine.....								
Inyo.....	\$1,837	.04	\$2,776	.05	\$3,615	.05	\$4,203	.05
Mono.....								
Totals.....	\$1,837	.04	\$2,776	.05	\$3,615	.05	\$4,203	.05

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Alpine.....	\$284	\$879	109.46	\$391	\$1,564	113.83	77.93
Inyo.....	5,748	754	93.90	9,260	975	70.96	29.31
Mono.....	1,538	669	83.31	2,058	1,646	119.80	146.04
Totals.....	\$7,570	\$739	92.04	\$11,709	\$1,064	77.44	43.98

Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Alpine.....	\$901,059	\$3,739	208.07	-----	\$1,262,257	\$4,429	406.70	+18.45
Inyo.....	19,694,765	3,005	167.22	-----	19,093,975	2,806	257.67	-6.62
Mono.....	6,624,202	4,871	271.06	-----	5,085,990	2,245	206.15	-53.91
Totals.....	\$27,220,026	\$3,337	185.70	-----	\$25,442,222	\$3,119	286.41	-6.53
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Alpine.....	\$1,412,626	\$4,373	423.33	-1.27	\$1,455,072	\$5,820	414.53	33.09
Inyo.....	14,453,101	1,895	183.45	-32.47	17,504,262	1,843	131.27	-2.75
Mono.....	5,926,275	2,578	249.56	14.83	6,165,828	4,933	351.35	91.35
Totals.....	\$21,792,002	\$2,127	205.91	-31.81	\$25,125,162	\$2,284	162.96	7.38

TABLE 110—Continued
 INDICES OF PURCHASING POWER FOR AREA 7
 Per Capita Automobile and Truck Registrations ^a—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Alpine.....	93	.39	108.33	-----	140	.49	140.00	25.64
Inyo.....	2,800	.43	119.44	-----	2,650	.39	111.43	—9.30
Mono.....	477	.35	97.22	-----	669	.30	85.71	—14.29
Totals.....	3,370	.41	113.89	-----	3,459	.37	105.71	—9.76
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Alpine.....	139	.43	108.00	—12.25	103	.41	132.26	—4.65
Inyo.....	3,431	.45	113.00	15.38	3,042	.32	103.23	—28.89
Mono.....	874	.38	95.00	26.67	514	.41	132.26	—21.06
Totals.....	4,444	.43	108.00	16.22	3,659	.33	106.45	—23.26

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Alpine.....	\$19	\$79	13.96	-----	\$24	\$84	21.93	—89.37
Inyo.....	2,865	437	77.21	-----	2,128	313	81.72	—28.38
Mono.....	312	229	40.46	-----	318	140	36.55	—38.86
Totals.....	\$3,196	\$392	69.26	-----	\$2,470	\$264	68.93	—32.65
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Alpine.....	\$31	\$96	20.82	14.29	\$65	\$201	27.20	109.38
Inyo.....	4,092	537	116.49	71.57	6,761	887	120.03	65.18
Mono.....	814	354	76.79	152.86	923	401	54.26	13.28
Totals.....	\$4,937	\$482	104.56	82.57	\$7,749	\$756	102.30	56.85

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Population

Though hundreds of thousands of sportsmen and resort guests frequent this Area throughout the year, the actual resident population is small. An examination of Table 111 indicates that the Area has enjoyed a steady population increase though barely maintaining

a rate comparable to the growth of the State as a whole. It is estimated that in 1950 and 1955 the same ratio will be maintained as now prevails. Table 112 shows the population growth from the beginning of the century to the present for the counties and incorporated towns, and the present population of unincorporated places

TABLE 111
POPULATION OF AREA 7 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930				1945			
Alpine.....	241			Alpine.....	250		—22.60
Inyo.....	6,555	.12		Inyo.....	9,500	.11	24.59
Mono.....	1,360	.02		Mono.....	1,250	.01	—45.63
Total Area 7.....	8,156	.14		Total Area 7.....	11,000	.12	7.35
1935				1950			
Alpine.....	285		18.25	Alpine.....	270	.01	8.00
Inyo.....	6,805	.11	3.81	Inyo.....	10,155	.10	6.89
Mono.....	2,265	.04	66.54	Mono.....	1,275	.01	2.00
Total Area 7.....	9,355	.15	14.70	Total Area 7.....	11,700	.12	6.36
1940				1955			
Alpine.....	323	.01	13.33	Alpine.....	298	.01	10.37
Inyo.....	7,625	.11	12.05	Inyo.....	11,240	.10	10.68
Mono.....	2,299	.03	1.50	Mono.....	1,437	.01	12.71
Total Area 7.....	10,247	.15	9.53	Total Area 7.....	12,975	.12	10.90

Source : Same as Table 93, Page 244.

TABLE 112
POPULATION STATISTICS OF AREA 7
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 7.....		7,053	9,325	8,234	8,156	10,247	†11,720	
Alpine County.....		509	309	243	241	323	†320	
Inyo County.....		4,377	6,974	7,031	6,555	7,625	†9,900	
Bishop.....	1903		1,190	1,304	1,159	1,490		
Mono County.....		2,167	2,042	960	1,360	2,290	†1,500	

† Estimate of California Taxpayers' Association.

Unincorporated Places

	Population		Population
Alpine County		Keeler.....	350
Fredericksburg.....	100	Laws.....	100
Markleeville.....	125	Lone Pine.....	1,056
Inyo County		Mono County	
Big Pine.....	556	Benton.....	300
Bishop Creek.....	175	Bodie.....	100
Death Valley.....	125	Bridgeport.....	200
Independence.....	569	June Lake.....	100

Source : 1940 Census or later semi-official estimates from Roster, Public Officials of California, Secretary of State.

AERONAUTICAL APPRAISAL

Area 7 has a large number of operating airports in comparison to its population; however, all but one of these facilities are concentrated in Inyo County. There is one airport in Mono County and none in Alpine, but

both these counties are principally of mountainous terrain that offers few favorable airport sites. Listed below are the location and description of these airports.

<i>M-7 Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
INYO COUNTY			
7- 1	Death Valley—Furnace Creek	U.S. N.P.S.	S-2
7- 2	Darwin—Panamint Springs	U.S. Pub. Dom.	1
7- 3	Darwin	U.S. Pub. Dom.	S-1
7- 4	Bishop—Coyote Meadows	U.S. Pub. Dom.	S-1
7- 5	Trona—CAA Site #73	U.S. C.A.A.	S-5
7-25	Bishop	County of Inyo	6
7-26	Big Pine	County of Inyo	2
7-27	Independence	County of Inyo	S-2
7-28	Manzanar	County of Inyo	3
7-29	Lone Pine	County of Inyo	1
7-50	Bishop—Symons	Commercial-Private	1
7-51	Olancha—Adamson	Commercial-Private	1
7-52	Olancha—Grant Airpark	Commercial-Private	S-2
7-53	Coso Junction—Gill	Private	S-2
7-55	Death Valley Jct.—Amargosa	Private	1
7-56	Deep Springs	Private	S-1
MONO COUNTY			
7-60	Bridgeport	Private	S-2

To date there is no scheduled air traffic to this section of the State, but Pick Up Airlines, Inc., a non-scheduled airline operating between Reno and Los Angeles, makes intermittent stops at Bishop to take on or discharge passengers. United Air Lines, Nevada-Pacific Airlines and Southwest Airways have petitioned the Civil Aeronautics Board for a franchise to operate from Reno to Los Angeles with indicated service to Bishop and other points in the Owens Valley. Of the three, Southwest Airways would offer the more complete service because stops have been requested for Trona, Death Valley, Independence and Bishop. The northern terminal of this service would be Reno, although there would be connecting service at that point that would allow direct flight contact, by a circuitous route, with all of northern California, and the

southern co-terminals would be Los Angeles and Burbank, with connecting flights at these points that would allow easy access to all of Southern California.

Private plane activity for business and pleasure transportation to and from this Area will undoubtedly be high because of the obvious time saving that would be effected through this mode of travel as compared to surface carriers that must necessarily use indirect routes. Executives of mining organizations could expedite business arrangements by private plane use, and sportsmen would be able to devote a majority rather than a minority of their time to actual fishing and hunting.

Because large parts of this area are virtually isolated during the winter, good airports would prove extremely desirable in case of civil emergencies.

SCHEDULED AIR TRANSPORT

Taking into consideration the geographical isolation of Area 7, as well as a part of the tourist potential that could well travel by commercial air lines, a comparatively high interest factor of population has been estimated for commercial service in this part of the State. Applying that interest factor to the projected population and thereby forecasting commercial air passengers, it is predicted that the Bishop Area will develop 2,122 on and off passengers in 1950 and 3,082 in 1955, while the Manzanar-Independence Area will develop 1,414 on and off passengers in 1950 and 2,054 in 1955, for overall totals of 3,536 passengers in 1950 and 5,136 in 1955. Considering a seat use of approxi-

mately two passengers per flight, this results in a year-round average of 3 in and out schedules per day in 1950 and 5 per day in 1955. Additionally both the Trona and Death Valley stops would produce a small passenger load but this load could easily be handled by the flights serving Independence and Bishop.

There is some prospect of the utilization of air freight to supplement production in this Area, also, a definite possibility of the mail service that is now being carried on by truck, being transferred to air carriers. This would naturally increase the projected daily commercial landings to some degree, but it is unlikely that this additional service would require more than one

additional in and out flight per day in 1950 or 1955, because scheduled carriers could serve the greater part of these requirements.

All of the proposed air carrier stops now have adequate facilities with the exception of Death Valley, which has a Sub-2 facility at Furnace Creek that should be developed to a Class 3 airport to safely accommodate commercial types of aircraft. Although the present public facility at Independence is a Sub-5, Manzanar,

only a few miles distant, has a full Class 3 airport, which could be used for scheduled operations.

Of major importance in estimating the opportunities for air transport in this Area is the relative isolation of its principal towns, the distances by highway (250 miles or more) to its chief trading centers—Reno and Los Angeles, and the absence of suitable rail service to either. Dependable air service to Area 7 would be a boon to its people and aid materially in the development of its communities.

PRIVATE FLYING ESTIMATES

Estimated private plane ownership for 1950 and 1955 is based upon an index of economic buying potential and private plane per capita ownership and shows the following county distribution:

Counties	Index	Private Plane Ownership	
		1950	1955
Alpine -----	60	NONE	
Inyo -----	309	61	138
Mono -----	75	2	4
Total -----		63	142

Further distributing these planes among the judicial townships, based upon population and average unit rental, the results are as follows:

INYO COUNTY				
Township	Pct.	1950	1955	
1 -----	56.30	34	78	
2 -----	5.82	4	8	
3 -----	9.91	6	14	
4 -----	22.00	13	30	
5 -----	5.97	4	8	

MONO COUNTY

Township	Pct.	1950	1955
Antelope -----	8.94	--	--
Benton -----	13.82	--	1
Bodie -----	2.72	--	--
Bridgeport -----	15.57	--	1
Homer -----	33.13	1	1
Mammoth -----	26.33	1	1

Area 7 is, to a greater extent than any other portion of the State, the playground and recreational center for a predominantly "outside" population. More than one-quarter million visitors are entertained annually. These include hunters, fishing enthusiasts and vacationists all of whom find unsurpassed pleasure in the High Sierra country so easily accessible from the towns of Inyo, Mono and Alpine Counties. This tourist potential has more effect on the airport and private flying requirements of this area than any local ownership potential and warrants extensive preparation for its accommodation.

AIRPORT REQUIREMENTS

While Area 7 is more amply provided with good airports than any other section of California, and while the total is more than adequate for any contemplated local potential, there remain several serious deficiencies in coverage, quality and convenience which the following recommendations are designed to correct:

INYO COUNTY

Coyote Meadows

This unimproved mountain meadow southwest of Bishop provides a sub-standard Class 1 landing field in a primitive area. It is recommended that it be developed to a Class 2 airport by 1950 to accommodate recreational and Forest Service interests.

Lone Pine

This town now possesses a Class 1 airport but recommendation is made that a Class 2 facility be developed by 1950. The community is not only the starting point for Mount Whitney and a winter sports center, but serves an estimated resident population of 3,000. These residents represent a private aircraft

ownership potential of 48 by 1955. Add to this factor the non-scheduled operations and the expressed requirement of the U. S. Forest Service, and the necessity for a Class 2 development becomes apparent.

Coso Junction

This region is now served by a privately owned sub-standard Class 2 airport. Because of the community's isolation and the nearby Coso Hot Springs, a Class 2 development is recommended by 1955. The U. S. Forest Service requirements would be met by this improvement. The proposed airport would provide a needed emergency facility midway between Inyokern and Olancha on a main air route. The terrain affords few safe emergency landing places.

Death Valley National Monument

This area of isolation and scenic grandeur is most readily accessible by air. It is one of the very few National Parks or Monuments affording airport facilities within its boundary. Furnace Creek, the headquarters, is presently served by a sub-standard Class 2 airport. It has a rough gravel surface, a single run-

way and lacks lighting and similar adjuncts. Travel to the area is highly seasonal, being confined to winter months when the population of resorts and small communities of the area reaches a high of 1,000 persons. Application is now pending for a Feeder Air Transport service—a development which would greatly increase the number of visitors to this interesting region. The present airport should be improved both for feederline and non-scheduled use, and the development to Class 3 standards by 1950 is recommended. A paved runway is considered essential to regular use by transport aircraft.

ALPINE COUNTY

Markleeville

No airport exists in this entire County and a Class 1 development is recommended for the vicinity of Markleeville by 1955. While the present population fails to justify the facility, it is desirable for access to recreational areas, and to integrate the community more closely with California's economic sphere. The lack of railroad facilities in the County has contributed to its inaccessibility and an airport would offset this handicap. The nearest airport to Markleeville, the county seat, is at Minden, Nevada, 25 miles distant by highway.

MONO COUNTY

Bridgeport

This principal town and County Seat of Mono County is dependent entirely upon highway transportation. It is 60 miles from the nearest good airport at Minden, Nevada to the north and 75 air miles from its nearest neighboring airport to the southeast at Bishop. It is a popular vacation area and supply point

for tourists to the many nearby resorts and camps. As is generally true of Area 7, local potential will not justify more than the present privately owned, unimproved Class Sub-2 airport. However, travel potential to this section, plus the needs for a facility suitable for the elevation (6,465 feet) in a region devoid of other airports, dictates the development of a good Class 2 airport in this locality without undue delay. Improvement to Class 2 by 1950 is therefore urged.

Leevining-Mono Lake

Here also the access to a vacationist's paradise—the Tioga Pass Country—argues the need for a landing facility to complete the desired objective of making California's scenic attraction available to air travelers. While only 20 air miles southerly from Bridgeport, the Mono basin is 60 air miles northwest of the nearest existing airport at Bishop. This is a distinct disadvantage in forest protection activities. Immediate development of a Class 2 facility in this area is recommended.

Mammoth Lakes

This locality possesses some of the finest scenery in California, with many good resorts and vacation facilities. While only 20 air miles south of Leevining, it is separated therefrom by a range of mountains. It is 40 miles northwesterly from Bishop, the nearest improved airport. While one resort in this vicinity boasts a private airport, there is a real need for a standard Class 2 airport here to provide the necessary coverage of the State's recreational areas and to supply an indicated need of the Forest Service. Immediate development of a standard Class 1 airport is recommended, with provision made for expansion to Class 2 by 1955.

The foregoing recommendations include those essential to Area 7 for the period of this study.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 7

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Alpine County Markleeville.....						1	R,NS,FS (New)
Inyo County							
Death Valley.....	Furnace Creek.....	USNPS.....	S-2	3	FP,NS,R		
Coyote Meadows.....	Coyote Meadows.....	USPD.....	S-1	2	FS,R,NS		
Lone Pine.....	Lone Pine.....	County.....	1	2	FS,R,NS		
Coso Junction.....	Gill.....	Private.....	(S-2)			2	FS,R,NS
Mono County							
Leevining.....				2	FS,NS,R		
Mammoth Lake.....				1	R,FS,NS		
Bridgeport.....		Private.....	(S-2)	2	FS,NS,R		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

APPENDIX 8

AREA 8—STOCKTON METROPOLITAN

NATURAL CHARACTERISTICS

Area 8, about one-twentieth of the land surface of the entire State, includes San Joaquin, Calaveras, Stanislaus, Tuolumne, Merced, and Mariposa Counties.

Geography and Topography

The Stockton Metropolitan Area, lying just north of the center of the State, is encircled by Sacramento and Amador Counties on the north, Alpine and Mono on the east, Fresno and Madera on the south, and Contra Costa, Alameda, Santa Clara, and San Benito on the west. Occupying the head of the fertile San Joaquin Valley, the area extends from the Coast Range to the crest of the Sierra Nevadas. The level planes of the valley bottom, only a few hundred feet above sea level, merge into foothills and then into the lofty peaks of the Sierra Nevada Divide, from 10,000 to 13,000 feet high.

Numerous smaller rivers—the Mokelumne, Calaveras, Stanislaus, Tuolumne, and Merced—flow from the Sierra Nevadas into the San Joaquin, forming a unified drainage system for the Area. The Pardee, Calaveras, Melones, Hetch Hetchy, and Lake Eleanor Reservoirs, and the Exchequer and other dams, provide abundant water for irrigation and hydroelectric needs. When completed, the Central Valley Project will supplement present resources.

Climate

The climate of the valley and mountain districts varies considerably. In the San Joaquin Valley, a warm, dry summer is succeeded by rain in autumn and winter with some frost. Average temperatures at Stockton

range from 37° to 53° in January, and from 58° to 89° in July. In summer, temperatures may soar over a hundred, but nights are usually cool. The average rainfall is 14 inches.

The western Sierra slope has a cooler climate with more rain and heavy snowfalls on the peaks in winter. In Yosemite, at an elevation of 3,983 feet, the average January temperature varies between 22° and 46°, the July between 49° and 90°, and the average rainfall is 33 inches.

The valley weather affords a long growing period for crops, whereas the more bracing temperatures of the mountains is a great attraction for tourists and sportsmen.

Land Usage

The following table of land usage in the area shows that approximately half of the land is used for farms and nearly one-fifth is devoted to national forests and parks (from Table 15):

Land in Farms-----	3,167,525 acres
Land in Crops-----	957,851 acres
Idle Cropland -----	794,975 acres
Woodland and Other	1,414,699 acres
Other Private Land---	1,003,880 acres
Total Privately Owned	4,171,405 acres
National Forests and Parks -----	1,482,977 acres
Other Public Lands---	526,098 acres
Total Public Owned-----	2,009,075 acres
	6,180,480 acres

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

The Stockton Metropolitan Area—rich in natural resources and with its economy firmly based on agriculture, lumbering, and mining—produces a substantial portion of the wealth of California. The nature of commodities produced and the large influx of tourists both require adequate airport facilities.

Agriculture

The three valley counties—San Joaquin, Stanislaus, and Merced—because of the wide variety of their soil

suitable for different crops and their length of growing season, are one of the most productive agricultural communities in the United States. Some idea of the types of crops grown can be gained from a ranking of the seven most valuable agricultural products (from Table 24):

In 1940 San Joaquin County led the State in the value of table grapes, asparagus, and tomatoes produced.

A complete tabulation of the volume of carloads of agricultural produce shipped from the Area in 1945 follows on Page 342.

County	1st	2d	3d	4th	5th	6th	7th
Merced-----	Dairy	Beef	Barley	Eggs, Turkeys	Cotton	Figs	Grapes
San Joaquin-----	Table Grapes	Asparagus	Beef	Dairy	Sugar Beets	Tomatoes	Potatoes
Stanislaus-----	Dairy	Beans	Alfalfa	Beef	Peaches	Sheep	Grapes

Source: California State Chamber of Commerce, Research Department.

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Calaveras	Merced	San Joaquin	Stanislaus
Apples.....			1	
Apricots.....			1	
Asparagus.....			495	
Beans (Snap and Lima).....			10	
Beets (Edible).....			9	
Cantaloupes.....		1,082	19	212
Carrots.....		24	578	
Casabas.....		1	1	111
Cauliflower.....			14	
Celery.....			3,990	
Cherries.....			527	
Corn (Green).....		11		
Grapes.....	2	300	5,738	1,605
Honeyball Melons.....		6		
Honeydew Melons.....		80	5	526
Lettuce and Romaine.....		5	63	4
Mixed Deciduous Fruit.....			11	
Mixed Melons.....		20		351
Mixed Vegetables.....			119	
Onions.....		38	1,494	5
Oranges and Satsumas.....			1	
Peaches.....		315	159	340
Peaches (Dried).....		18	2	12
Pears.....			58	
Peas (Green).....		33	283	
Peppers.....		21	12	
Persian Melons.....				6
Plums and Fresh Prunes.....		28	197	7
Potatoes (White or Irish).....			4,282	
Sweet Potatoes.....		195	159	74
Tomatoes.....		955	427	67
Turnips and Rutabagas.....			1	
Watermelons.....		40	119	226
Total.....	2	3,172	18,775	3,546
Grand Total.....				25,475

Source: *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			Percent change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Calaveras.....	1,000	.15	.01	2,291	.13	.01	129.10
Mariposa.....	780	.11	.01	1,637	.09	.01	109.87
Merced.....	20,300	3.02	.24	54,995	3.08	.26	170.91
San Joaquin.....	39,000	5.80	.47	117,554	6.58	.57	201.42
Stanislaus.....	25,700	3.82	.31	72,986	4.09	.35	183.99
Tuolumne.....	950	.14	.01	1,861	.10	.01	95.89
Totals.....	\$87,730	13.04	1.05	\$251,324	14.07	1.21	186.47

Source: California Crop and Livestock Reporting Service. United States totals from *Statistical Abstract of the United States, 1946*.

In 1945 this Aviation Area ranked third in the State in the value of agricultural production. The gross cash farm income of the United States increased 149.08 percent between 1940 and 1945, that of California increased 165.48 percent. The foregoing summary shows that the gross cash farm income for the Area increased considerably more rapidly during the same period.

The Area's agricultural industry has already made a start in the use of aircraft for seeding, crop dusting, and shipment of perishables. Such a use is bound to increase as the producers acquire a wider knowledge of the possibilities. A projection of the volume of perishables likely to move by air in 1950 and 1955 will be given later.

Timber Production

Timber production in the three mountain counties of the Area is large. It is estimated that the stands equal 15,458,000,000 board feet.¹ In 1945, 162,060,000 board feet—7.17 percent of the State total production—were cut.²

Aside from their commercial value, the groves of big trees, the woods full of game, and the Sierra forests famous since the days of John Muir have an inestimable value as tourist attractions. To protect these forests adequately the Federal and State forestry services have requested the following airport facilities.

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 8 by Counties

Calaveras County

1. Class 1 at San Andreas—State Division of Forestry

Mariposa County

1. Class 1 at Usona—State Division of Forestry
 2. Class 1 at Coulterville—State Division of Forestry
 3. Class 2 at Wawona—United States Forest Service
 4. Class 2 at Mariposa—United States Forest Service
- The State Division of Forestry will use Mariposa Airport in its present condition—Class 1.

Merced County

1. Class 1 at Lookout Mt.—State Division of Forestry
- The State Division of Forestry will use Los Banos and Dos Palos Fields in their existing condition.

San Joaquin County

None

Tuolumne County

1. Class 2 at Columbia (Sonora)—United States Forest Service
- The State Division of Forestry will use Columbia Airport in its present condition—Class 1.

Stanislaus County

None

¹ California Forest and Range Experiment Station, Forest Survey Release No. 4, March 1, 1946. (Table 23.)

² United States Department of Agriculture Forest Service, California Forest and Range Experiment Station, *Forest Research Notes*, No. 50, Sept. 12, 1946. (Table 23.)

Mineral Production

Mineral production in the Area is also found chiefly in the three mountain counties. Gold has been mined since Pioneer days. Zinc, copper, manganese, cement, and stone are also produced in quantity. Airplanes have already been used to transport gold and metal concentrates. In the future, private aircraft may be used to carry workers to relatively inaccessible spots. A table of the value of mineral production from 1930 to 1945 follows:

VALUE OF MINERAL PRODUCTION IN AREA 8

	Mineral Production	Percent of California	Percent of U. S.	Percent Change from Preceding Period
1930				
Calaveras.....	\$2,083,956	.57	.04	-----
Mariposa.....	143,465	.04	-----	-----
Merced.....	801,900	.22	.02	-----
San Joaquin.....	724,862	.20	.01	-----
Stanislaus.....	331,688	.09	.01	-----
Tuolumne.....	318,322	.08	.01	-----
Totals.....	\$4,404,193	1.20	.09	-----
1935				
Calaveras.....	\$2,312,953	.88	.06	10.99
Mariposa.....	873,242	.33	.02	508.68
Merced.....	1,704,775	.65	.05	112.59
San Joaquin.....	416,270	.16	.01	—42.57
Stanislaus.....	585,656	.22	.02	76.57
Tuolumne.....	474,610	.18	.01	49.10
Totals.....	\$6,367,506	2.42	.17	44.58
1940				
Calaveras.....	\$4,233,835	1.24	.08	83.05
Mariposa.....	1,224,336	.36	.02	40.21
Merced.....	2,514,323	.73	.04	47.49
San Joaquin.....	1,146,912	.33	.02	175.52
Stanislaus.....	1,558,205	.46	.03	166.06
Tuolumne.....	1,032,567	.30	.02	117.56
Totals.....	\$11,710,178	3.42	.21	83.91
1945				
Calaveras.....	\$2,789,881	.59	-----	—34.11
Mariposa.....	1,171,094	.25	-----	—4.35
Merced.....	285,363	.06	-----	—88.65
San Joaquin.....	1,256,594	.27	-----	9.56
Stanislaus.....	406,727	.08	-----	—73.90
Tuolumne.....	434,626	.09	-----	—57.91
Totals.....	\$6,344,285	1.34	-----	—45.92

Sources: *Minerals Yearbook Review of 1940*, California Division of Mines Bulletins, California State Chamber of Commerce.

Manufacturing

The processing, packaging, and canning of food and the manufacture of cement are the main manufacturing industries of the Area. The increase in value of manufactured products from 1929 to 1939 is shown on the following summary:

VALUE OF MANUFACTURES IN AREA 8

	1929		1939	
	Value of Manufacturing	Percent of California	Value of Manufacturing	Percent of California
California.....	\$2,950,053,451	100.00	\$2,798,179,523	100.00
*Calaveras.....			2,791,851	.10
Mariposa.....			9,819,506	.35
Merced.....	8,582,568	.29	46,692,201	1.67
San Joaquin.....	37,020,323	1.25	25,851,109	.92
Stanislaus.....	21,742,168	.74	2,807,224	.10
Tuolumne.....				
Totals.....	\$67,345,059	2.28	\$87,961,891	3.14

* Combined with Mariposa to avoid disclosing output of individual establishments.

Source: United States Census of Manufacturers.

Tourist and Travel Industry

National forests and parks cover nearly one-fifth of Area 8. Stanislaus and Sierra National Forests, Yosemite National Park, and several groves of giant sequoias are famous throughout the world for their unique beauty. Visitors to Yosemite in 1946 were already exceeding the pre-war total. A summary of the volume of visitors by way of the two points of entry in the Area follows:

<i>Point of Entry</i>	<i>Number of Visitors 1941</i>	<i>Number of Visitors 1946</i>
Arch Rock	245,421	269,489
Big Oak Flat	67,806	77,787
	<u>313,227</u>	<u>347,276</u>

In 1946 there were 72,801 visitors to Calaveras Big Trees. In addition, thousands of sportsmen visit the Area each year to fish and hunt, and in winter the resorts are crowded with skiers and skaters. Improved commercial passenger service and added facilities for private planes are needed to meet the growing demands of tourists and vacationists for speedier transportation.

Distribution and Transportation

Main lines of the Southern Pacific and the Atchison, Topeka and Santa Fe Railroads run north and south through the three valley counties and the Western Pacific goes through San Joaquin County. The Sierra communities are served by branch lines of these or by independent connecting lines.

Highways No. 33 and 99 run roughly parallel north and south through the valley and a complete network of branch highways and roads connect these main arteries with the mountain counties. Several bus companies offer extensive passenger service and numerous trucks transport agricultural produce to local points and outside metropolitan centers.

Existing aircraft facilities are discussed later.

Indices of Purchasing Power

Certain of the indices listed in Table 113 show Area 8 below the State average. It must be kept in mind, however, that several of the wealthy, populous areas make the State average unusually high. Both bank deposits and per capita individual incomes have increased steadily and the per capita automobile registrations have been significantly greater than the State average. An area interested in buying automobiles should be interested in buying private planes.

TABLE 113
 INDICES OF PURCHASING POWER FOR AREA 8
 Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
 (In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Calaveras.....	\$2,562	.06	\$2,786	.05	\$3,476	.05	\$4,104	.05
Mariposa.....	313	.01	450	.01	563	.01	676	.01
Merced.....	14,357	.34	20,028	.36	28,489	.40	35,537	.41
San Joaquin.....	57,747	1.35	82,671	1.50	124,735	1.74	160,896	1.85
Stanislaus.....	28,441	.67	41,772	.76	62,978	.87	84,063	.97
Tuolumne.....	3,144	.07	3,588	.07	4,472	.06	5,550	.06
Totals.....	\$106,564	2.50	\$151,295	2.75	\$224,713	3.13	\$290,826	3.35

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Calaveras.....	\$5,138	\$626	77.83	\$7,210	\$853	62.08	36.48
Mariposa.....	3,538	631	78.58	4,725	1,167	84.93	84.94
Merced.....	26,916	573	71.36	64,879	1,239	90.17	116.23
San Joaquin.....	88,074	656	81.69	242,396	1,314	95.63	100.30
Stanislaus.....	43,762	585	72.85	109,675	1,025	74.60	75.21
Tuolumne.....	7,022	645	80.32	9,622	948	69.00	46.98
Totals.....	\$174,450	\$621	77.35	\$438,507	\$1,196	87.05	92.59

Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Calaveras.....	\$9,557,105	\$1,591	88.54	-----	\$9,385,730	\$1,496	137.37	-5.97
Mariposa.....	6,092,436	1,884	104.84	-----	4,537,789	1,048	96.24	-44.37
Merced.....	45,788,941	1,246	69.34	-----	52,878,405	1,384	127.09	+11.08
San Joaquin.....	149,870,943	1,456	81.02	-----	113,255,305	994	91.28	-31.73
Stanislaus.....	68,871,338	1,216	67.67	-----	61,612,110	1,011	92.84	-16.86
Tuolumne.....	12,396,544	1,337	74.40	-----	14,791,425	1,575	144.63	+17.80
Totals.....	\$292,577,307	\$1,362	75.79	-----	\$266,460,764	\$1,100	101.01	-19.24
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Calaveras.....	\$11,184,200	\$1,360	131.66	-9.09	\$12,346,530	\$1,461	104.06	7.43
Mariposa.....	5,018,766	895	86.64	-14.60	6,066,115	1,498	106.70	67.37
Merced.....	51,511,045	1,096	106.10	-20.81	60,656,480	1,159	82.55	5.75
San Joaquin.....	125,576,240	936	90.61	-5.84	167,749,285	909	64.74	-2.89
Stanislaus.....	65,793,160	879	85.09	-13.06	89,702,290	838	59.69	-4.67
Tuolumne.....	15,438,674	1,418	137.27	-9.97	15,121,325	1,490	106.13	5.08
Totals.....	\$274,522,085	\$978	94.68	-11.09	\$351,642,025	\$959	68.30	-1.94

CALIFORNIA AIRPORTS

TABLE 113—Continued
 INDICES OF PURCHASING POWER FOR AREA 8
 Per Capita Automobile and Truck Registrations ^a—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Calaveras.....	2,365	.39	108.33	-----	2,870	.46	131.43	17.95
Mariposa.....	1,269	.39	108.33	-----	1,814	.42	120.00	7.69
Merced.....	14,537	.40	111.11	-----	14,893	.39	111.43	-2.50
San Joaquin.....	38,628	.38	105.56	-----	43,090	.38	108.57	-----
Stanislaus.....	25,318	.45	125.00	-----	26,356	.43	122.86	-4.45
Tuolumne.....	3,172	.34	94.44	-----	3,506	.37	105.71	8.82
Totals.....	85,289	.40	111.11	-----	92,529	.40	114.29	2.86
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Calaveras.....	3,734	.45	113.00	-2.17	2,800	.33	106.45	-26.67
Mariposa.....	2,390	.43	108.00	2.38	1,485	.37	119.35	-13.96
Merced.....	18,983	.40	100.00	2.56	19,097	.36	116.13	-10.00
San Joaquin.....	53,208	.40	100.00	5.26	58,267	.32	103.23	-20.00
Stanislaus.....	32,674	.44	110.00	2.32	35,252	.33	106.45	-25.00
Tuolumne.....	4,761	.44	110.00	18.92	3,644	.36	116.13	-18.19
Totals.....	115,750	.41	103.00	2.50	120,545	.33	106.45	-19.51

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Calaveras.....	\$1,689	\$281	49.65	-----	\$1,738	\$277	72.32	-1.42
Mariposa.....	1,255	388	68.55	-----	1,078	249	65.01	-35.82
Merced.....	17,007	463	81.80	-----	13,873	363	94.78	-21.60
San Joaquin.....	50,499	491	86.75	-----	44,284	389	101.57	-20.77
Stanislaus.....	33,076	584	103.18	-----	26,317	432	112.79	-26.03
Tuolumne.....	3,860	416	73.50	-----	3,596	383	100.00	-7.93
Totals.....	\$107,386	\$500	88.34	-----	\$90,886	\$390	101.83	-22.00
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Calaveras.....	\$2,799	\$340	73.75	22.74	\$3,220	\$392	53.04	15.29
Mariposa.....	1,662	297	64.43	19.28	2,231	398	53.86	34.01
Merced.....	17,877	380	82.43	4.68	31,857	678	91.75	78.42
San Joaquin.....	55,130	411	89.15	5.65	124,040	924	125.03	124.82
Stanislaus.....	34,641	463	100.43	7.17	64,438	861	116.51	85.96
Tuolumne.....	5,120	470	101.95	22.72	6,633	609	82.41	29.57
Totals.....	\$117,229	\$418	76.79	7.18	\$232,419	\$828	112.04	98.09

Sources: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Population

Table 114 indicates that with the exception of one five year period, the population of the Area has been

increasing at a slightly greater rate than the State as a whole. The estimates for 1950 and 1955 continue this accelerated percentage. Table 115 lists the population growth for the incorporated and unincorporated cities.

TABLE 114
POPULATION OF AREA 8 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930 ^a				1945 ^d			
Calaveras.....	6,008	.11		Calaveras.....	8,450	.09	2.79
Mariposa.....	3,233	.05		Mariposa.....	4,050	.04	-27.74
Merced.....	36,748	.65		Merced.....	52,350	.58	11.41
San Joaquin.....	102,940	1.81		San Joaquin.....	184,500	2.03	37.47
Tuolumne.....	9,271	.16		Tuolumne.....	10,150	.11	-6.77
Stanislaus.....	56,641	1.00		Stanislaus.....	107,000	1.18	42.92
Total Area 8.....	214,841	3.78		Total Area 8.....	366,500	4.03	30.53
1935 ^b				1950 ^e			
Calaveras.....	6,275	.10	4.44	Calaveras.....	9,700	.10	14.79
Mariposa.....	4,330	.07	33.93	Mariposa.....	4,400	.04	8.64
Merced.....	38,195	.63	3.94	Merced.....	57,400	.58	9.65
San Joaquin.....	113,935	1.87	10.68	San Joaquin.....	203,550	2.05	10.33
Tuolumne.....	9,390	.16	1.28	Tuolumne.....	11,300	.11	11.33
Stanislaus.....	60,960	1.00	7.63	Stanislaus.....	123,500	1.24	15.42
Total Area 8.....	233,085	3.83	8.49	Total Area 8.....	409,850	4.12	11.83
1940 ^c				1955 ^f			
Calaveras.....	8,221	.12	31.01	Calaveras.....	10,850	.10	11.85
Mariposa.....	5,605	.08	29.45	Mariposa.....	4,950	.05	12.50
Merced.....	46,988	.68	23.02	Merced.....	64,700	.58	12.72
San Joaquin.....	134,207	1.94	17.79	San Joaquin.....	229,275	2.06	12.64
Tuolumne.....	10,887	.16	15.94	Tuolumne.....	12,650	.11	11.95
Stanislaus.....	74,866	1.08	22.81	Stanislaus.....	138,750	1.25	12.35
Total Area 8.....	280,774	4.06	20.46	Total Area 8.....	461,175	4.15	12.52

Source: Same as Table 93, Page 244.

TABLE 115
POPULATION STATISTICS OF AREA 8
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 8.....		81,303	111,507	164,767	214,841	280,774	†299,200	
Calaveras County.....		11,200	9,171	6,183	6,008	8,221	†9,900	
Angels.....	1912			941	915	1,163		
Mariposa County.....		4,720	3,956	2,775	3,233	5,605	†4,500	
Hornitos.....		205	160	100	62	159		
Merced County.....		9,215	15,148	24,579	36,748	46,988	†57,900	
Atwater.....	1922				917	1,235		
Dos Palos.....	1935					978	1,209	Nov. 28, 1945
Gustine.....	1915			716	1,016	1,355		
Livingston.....	1922				803	895		
Los Banos.....	1907		745	1,276	1,875	2,214	2,770	June 3, 1946
*Merced.....	1889	1,969	3,102	3,974	7,066	10,135	13,229	Nov. 9, 1946

CALIFORNIA AIRPORTS

TABLE 115—Continued
POPULATION STATISTICS OF AREA 8
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
San Joaquin County		35,452	50,731	79,905	102,940	134,207	†194,000	
*Lodi	1906		2,697	4,850	6,788	11,079	13,118	April 22, 1946
Manteca	1918			1,286	1,614	1,981	3,215	July 20, 1946
Ripon	1946					1,060		
*Stockton	1850	17,506	23,253	40,296	47,963	54,714	58,865	April 1, 1944
*Tracy	1910			2,450	3,829	4,056	7,499	Oct. 9, 1946
Stanislaus County		9,550	22,522	43,557	56,641	74,866	†121,300	
Ceres	1918			637	981	1,332		
*Modesto	1884	2,024	4,034	9,241	13,842	16,379	18,403	May 1, 1946
Newman	1908		892	1,251	1,269	1,214	1,529	Sept. 13, 1946
*Oakdale	1906		1,035	1,745	2,112	† 2,592	3,457	June 11, 1946
Patterson	1919			694	905	1,109		
Riverbank	1922				803	1,130	2,670	June 5, 1946
Turlock	1908		1,573	3,394	4,276	4,839	6,126	July 26, 1946
Tuolumne County		11,166	9,979	7,768	9,271	10,887	†11,600	
Sonora	1851	1,922	2,029	1,684	2,278	2,257		

* URBAN—1940.

† Classification changed to urban in this interval.

‡ Estimate of California Taxpayers' Association.

Unincorporated Places

Population	Population	Population
Calaveras County	Merced County	Stanislaus County
Altaville	Delhi	Crows Landing
Comanche	El Nido	Denair
Campo Seco	Hilmar	Empire
Copperopolis	Irwin	Grayson
Jenny Lind	Le Grand	Hughson
Melones	Merced Falls	Keyes
Milton	Planada	La Grange
Mokelumne Hill	Snelling	Riverbank
Murphys	Winton	Salida
Railroad Flat	San Joaquin County	Valley Home
San Andreas	Acampo	Waterford
Sheep Ranch	Clements	Westley
Vallecita	Escalon	
Valley Springs	Farmington	Tuolumne County
Wallace	French Camp	Big Oak Flat
West Point	Holt	Chinese Camp
	Lathrop	Columbia
	Linden	Groveland
	Lockeford	Jamestown
	Morada	Soulsbyville
	Peters	Standard
	Terminus	Stanislaus
	Thornton	Tuolumne
	Vernalis	Tuttletown
	Victor	
	Woodbridge	
Mariposa County		
Coulterville		
El Portal		
Hornitos		
Mariposa		
Usona		
Yosemite National Park		

The economic factors discussed demonstrate that the immediate aeronautical needs of the Area are to provide more adequate air freight service for agricul-

tural perishables and to establish a well integrated plan of local airports able to handle expanded passenger service and an increasing number of private planes.

AERONAUTICAL APPRAISAL

The mountainous terrain of Mariposa, Tuolumne and Calaveras Counties is not easily adapted to airport construction but this section of the State is reasonably well served by the many facilities found in San Joaquin, Stanislaus and Merced counties, where the land is generally flat with the exception of certain low rolling

foothills. As in other parts of the State, however, numerous of the existing facilities are sub-standard in relation to the recommended physical standards for airports and therefore, cannot provide maximum public service. The existing airports of Area 8 and their aeronautical description are listed below:

Plate M-8 Code	Ownership		Class
SAN JOAQUIN COUNTY			
8-25	Stockton—Municipal	City of Stockton	4
8-26	Lodi—Kingsbury	City of Lodi	3
8-27	Tracy—Municipal	City of Tracy	3
8-28	Tracy—New Jerusalem	City of Tracy	3
8-50	Stockton—Oranges	Commercial-Private	1
8-51	Stockton—West Lane	Commercial-Private	S-2
8-52	Stockton—Sky Ranch	Private	S-1
8-54	Lodi—Linds	Commercial-Private	S-2
8-55	Lodi—Airpark	Commercial-Private	S-2
8-56	Manteca—Summer Home	Private	1
STANISLAUS COUNTY			
8- 5	Crows Landing NAAS	U S Navy	6
8-30	Modesto Municipal	City of Modesto	3
8-31	Vernalis	County of Stanislaus	6
8-38	Turlock Municipal (Ballico)	(Airport in Merced County)	
8-60	Turlock—Airpark	Commercial-Private	S-1
8-61	Turlock—Atwood	Commercial-Private	S-1
8-62	Oakdale	Commercial-Private	1
8-63	Patterson	Commercial-Private	1
MERCED COUNTY			
8-10	Merced—Castle AAF	U S Army	3
8-11	Howard—Merced Aux. #3	War Surplus—U S Army	2
8-12	Athlone—Merced Aux. #4	War Surplus—U S Army	2
8-13	Potter—Merced Aux. #5	War Surplus—U S Army	2
8-35	Merced Municipal—New	City of Merced	3
8-36	Merced Municipal—Old	City of Merced	2
8-37	Los Banos Municipal	City of Los Banos	S-2
8-38	Turlock Municipal (Ballico)	City of Turlock	2
8-70	Gustine	Private	1
CALAVERAS COUNTY			
8-80	Valley Springs—Mother Lode	Commercial-Private	S-1
TUOLUMNE COUNTY			
8-45	Sonora (Columbia)	County of Tuolumne	1
MARIPOSA COUNTY			
8-48	Mariposa—Mt. Bullion	County of Mariposa	1

Existing stops of United Airlines service Merced, Modesto and Stockton, with two daily in and out flights at both Merced and Stockton and six daily at Modesto. The major terminals of these flights are Los Angeles and San Francisco, with limited en route stops at Bakersfield, Visalia, Fresno, and Salinas, due to the skip stop nature of current commercial operation. Thus Area 8 does not have the type of contact flight with the rest of California that will allow the maximum utilization of intra-state air transportation but does have good contact with the two major trading centers of California and therefore an opportunity for expansion of air traffic in the national and international spheres of business activity.

Records of United Airlines show the following activity for on and off air traffic from August to December, 1946:

	Passengers	Air Mail	Express and Freight
Merced	1,243	2,976 lbs	1,803 lbs
Modesto	1,779	3,903 lbs	10,508 lbs
Stockton	1,629	6,202 lbs	4,785 lbs
Totals	4,651	13,081 lbs	17,096 lbs

Although commercial air service has only had a five months operations history in this section of the State, these figures dramatically point out immediate acceptance and interest in all phases of air transportation and forecast full use of available services.

ESTIMATES OF SCHEDULED AIR TRAFFIC

Based upon the present type of commercial airline service into Area 8 and the indicated interest of the population within a 25 mile radius of present airline stops, it is estimated that the Area will develop an in and out passenger load of 10,255 in 1950 and 14,894 in 1955. Taking into consideration an average airline seat use of three units per scheduled flight, both incoming and outgoing, and a decrease of approximately 50 percent in traffic during the winter months, these passenger loads will require approximately 8 in and out flights per day in 1950 and 12 per day in 1955.

This commercial air passenger potential does not, however, take into consideration the establishment of

true feederline service in this Area and a change of this type would undoubtedly result in greater civilian travel. A feederline offering direct way stops at all the major trading centers of the State would allow business men to avail themselves of the benefits of the efficient and rapid travel provided by air carriers.

The agricultural productivity of Merced, San Joaquin, and Stanislaus Counties foretell an important place for this Area in the air freight industry, due to valuable and perishable nature of much of the fruit and vegetable harvest. Applying these factors to the known shipments for 1945, the following appraisal of air freight tonnage has been computed:

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Calaveras	Grapes	2	34	1	.3	5	1.7
	Totals	2	34				2
Mariposa	None						
Merced	Cantaloupes	1,082	11,902	2	238.0	8	952.2
	Casabas	1	11	0		2	.2
	Corn, Green	11	132	14	18.5	39	51.5
	Grapes	300	5,100	1	51.0	5	255.0
	Honeyball Melons	6	66	0		2	1.3
	Honeydew Melons	80	880	0		2	17.6
	Lettuce and Romaine	5	60	6	3.6	18	10.8
	Mixed Melons	20	220	0		2	4.4
	Peaches	315	3,780	7	264.6	23	869.4
	Peas, Green	33	330	3	9.9	17	56.1
	Peppers	21	252	5	12.6	14	35.3
	Plums and Fresh Prunes	28	420	1	4.2	13	54.6
	Tomatoes	955	12,415	23	2,855.5	43	5,338.5
	Turnips and Rutabagas	40	760	0		14	106.4
	Totals	2,897	36,328		3,458.0		7,753.0
San Joaquin	Apricots	1	15	2	.3	8	1.2
	Asparagus	495	5,940	15	891.0	28	1,663.2
	Beans (Snap and Lima)	10	100	10	10.0	50	50.0
	Cantaloupes	19	209	2	4.2	8	16.7
	Casabas	1	11	0		2	.2
	Cauliflower	14	168	0		6	10.1
	Celery	3,990	47,880	0		7	3,351.6
	Cherries	527	6,851	9	616.6	30	2,055.3
	Grapes	5,738	97,546	1	975.5	5	4,877.3
	Honeydew Melons	5	55	0		2	1.1
	Lettuce and Romaine	63	756	6	45.4	18	136.1
	Mixed Deciduous Fruit	11	154	2	3.1	8	12.3
	Mixed Vegetables	119	1,428	0		6	85.7
	Peaches	159	1,908	7	133.6	23	438.8
	Pears	58	870	0		2	17.4
	Peas Green	283	2,830	3	84.9	17	481.1
	Peppers	12	144	5	7.2	14	20.2
	Plums and Fresh Prunes	197	2,955	1	29.6	13	384.2
	Tomatoes	427	5,551	23	1,276.7	43	2,386.9
	Turnips and Rutabagas	1	19	0		14	2.7
	Totals	12,130	175,390		4,078.0		15,992.0

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Stanislaus.....	Cantaloupes.....	212	2,332	2	46.6	8	186.6
	Casabas.....	111	1,221	0	-----	2	24.4
	Grapes.....	1,605	27,285	1	272.9	5	1,364.3
	Honeydew Melons.....	526	5,786	0	-----	2	115.7
	Lettuce and Romaine.....	4	48	6	2.9	18	8.6
	Mixed Melons.....	351	3,861	0	-----	2	77.2
	Peaches.....	340	4,080	7	285.6	23	938.4
	Persian Melons.....	6	66	0	-----	2	1.3
	Plums and Fresh Prunes.....	7	105	1	1.1	13	13.7
	Tomatoes.....	67	871	23	200.3	43	374.5
	Totals.....	3,229	45,655	-----	809.0	-----	3,105.0
Tuolumne.....	None						
	Area Totals.....	18,258	257,407	-----	8,345.0	-----	26,852.0

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945*.
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

Summarizing the foregoing information and converting the tonnage into air freight carrier loads, the following maximum daily schedules are developed:

Striking a mid-point between DC-3 and DC-4 daily freight loads, daily landings would be about 16 in 1950 and 49 in 1955.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

AREA 8

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total.....		8,345	3,338	25	735	6
Calaveras.....						
Mariposa.....						
Merced.....	243	3,458	1,383	11.38	305	2.51
San Joaquin.....	287	4,078	1,631	11.37	359	2.50
Stanislaus.....	250	809	324	2.59	71	.57
Tuolumne.....						
1955 Total.....		26,852	10,741	80	2,366	18
Calaveras.....	250	2	1	.01		
Mariposa.....						
Merced.....	243	7,753	3,101	25.52	683	5.62
San Joaquin.....	287	15,992	6,397	44.58	1,409	9.82
Stanislaus.....	250	3,105	1,242	9.94	274	2.19
Tuolumne.....						

* Source: Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

Combining commercial passenger and freight schedules, airports and complementary facilities will be needed to accommodate at least 24 commercial aircraft landings in 1950 and 61 in 1955. Because these landings will be distributed between Merced, Stanislaus and San Joaquin Counties, the cities of Merced and Modesto

will need full scale Class 4 and 5 airports respectively by 1950, while Stockton should have a full scale Class 5 facility by the same date, inasmuch as it is contemplated using this airport as an alternate to the Bay Area for Trans-Pacific flights.

PRIVATE FLYING ESTIMATES

In predicting the private plane ownership, by combining the indices of current ownership and economic buying potential, the following projected distribution of planes by counties has been developed:

County	Index	Private Plane Ownership	
		1950	1955
Calaveras	82	15	36
Mariposa	96	8	18
Merced	125	140	324
San Joaquin	70	275	639
Stanislaus	54	128	302
Tuolumne	80	17	40
Total		583	1,359

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in the Non-Scheduled Aviation Projection, Part V.

CALAVERAS COUNTY

Township	Percent	1950	1955
Angels	30.54	5	11
Jenny Lind	13.21	2	5
Mokelumne Hill	4.40	-	-
Murphy	27.10	4	10
San Andreas	19.89	3	7
West Point	4.86	1	2

MARIPOSA COUNTY

Township	Percent	1950	1955
1	4.81	-	1
2	6.58	1	1
3	4.77	-	1
4	35.24	3	6
5	12.72	1	2
6	35.88	3	7

MERCED COUNTY				
Township	Percent	1950	1955	
1	2.05	3	7	
2	50.03	70	162	
3	12.33	17	40	
4	3.37	5	11	
5	10.67	15	35	
6	8.13	11	26	
7	7.10	10	23	
8	6.32	9	20	

SAN JOAQUIN COUNTY

Township	Percent	1950	1955
Castoria	5.52	15	35
Dent	2.44	7	16
Douglas	1.53	4	10
Elkhorn	11.42	31	73
Elliot	1.45	4	9
Liberty	1.21	3	8
O'Neal	38.88	107	248
Ripon	2.51	7	16
Stockton	23.08	64	148
Tulare	10.84	30	69
Union	1.12	3	7

STANISLAUS COUNTY

Township	Percent	1950	1955
Ceres	10.01	13	30
LaGrange	.31	-	1
Modesto	49.58	64	150
Newman	4.92	6	15
Oakdale	6.51	8	20
Patterson	5.66	7	17
Riverbank	4.66	6	14
Turlock	16.19	21	49
Waterford	2.16	3	6

TUOLUMNE COUNTY

Township	Percent	1950	1955
1	34.95	6	14
2	8.76	1	3
3	43.76	7	18
4	2.92	1	1
5	9.61	2	4

AIRPORT REQUIREMENTS

CALAVERAS COUNTY

San Andreas-Valley Springs

At the present time the airport requirements of this County are served by a privately owned sub-standard Class 1 airport 6.6 miles northeast of Valley Springs. Valley Springs is approximately ten air miles from San Andreas, the County Seat. While the 1955 private airplane ownership potential for the County does not justify more than a Class 1 facility, the desirability of planning for Class 2 airports at the County Seats of all California counties has been pointed out throughout this report. The seat of local government is generally the center of population and trading for the county. The State Division of Forestry has requested establishment of a Class 1 facility here. Therefore, development of a full standard Class 1 facility in this vicinity is recommended by 1950 with provision for expansion to Class 2 in 1955.

MARIPOSA COUNTY

Mariposa

This County's airport requirements are presently served by the Class 1 Mount Bullion Airport, county owned, four and one-half miles northwest of Mariposa. This airport is 42 air miles from the Columbia Airport at Sonora, 20 miles west of the recommended Wawona facility and 30 miles southeast of Merced. It is on a natural line of flight from San Joaquin Valley points to Yosemite National Park. An airport here serves a real emergency landing need of non-scheduled aviation. The population of the County, of which Mariposa is the county seat, was 4,300 in July, 1946. The resident private plane ownership potential for 1955 is small. However, Mariposa is on State Highway No. 140 between Merced and Yosemite National Park; this highway is one of the principal entries into the Park. The region offers great attraction to hunting and fishing enthusiasts, in addition to its major importance as a principal point of access to Yosemite National Park. An airport

at this location is of much greater usefulness to the State at large than to the local population. The 1947 National Airport Plan includes recommendation for the acquisition of property and work necessary to widen existing landing strip at this airport. Because Mariposa is the county seat, in an area attractive to sportsmen generally, and a locality where adequate emergency landing facilities for non-scheduled aviation should be provided, but particularly because it provides one of two principal means of access to the State's most important National Park, development of the present field to full Class 2 standards by 1950 is urgently recommended.

Wawona

Located on Highway 41, the direct route from Fresno and points south to Yosemite National Park, Wawona provides the second principal access to the Park. Establishment of a Class 2 airport at this location by 1950 is as urgently recommended as the Mariposa facility above mentioned since they are equally important. The United States Forest Service also recommends Class 2 installations at Wawona and Mariposa.

Coulterville

The State Division of Forestry has requested a Class 1 airport at this location to serve their needs. Coulterville is approximately twenty air miles northwest of Mariposa. Since it is believed the Forestry Services should be given all possible assistance in their fire prevention and forest patrol activities, especially in National and State Park and Monument areas, and non-scheduled aviation requirements are generally concurrently served, this study concurs in recommendation for establishment of Class 1 airport at Coulterville by 1950.

MERCED COUNTY

Merced

Merced, the county seat of the County, is the principal motor and rail entry to Yosemite National Park. Population of the County as of July 1, 1946 is 55,500. The private airplane ownership potential for Merced County is 324 for 1955. The County's civil airport needs are now served by the Merced Municipal Class 3 (the old Municipal Field here being closed), located close to town, one Municipal Class S-2 at Los Banos, Municipal Class 2 at Turlock and one Private Class 1 at Gustine. Further, the Municipal Class 1 at Dos Palos and the Private S-2 facility there, in neighboring Fresno County, are conveniently located to assist in servicing the southern sector of Merced County. This coverage is considered adequate for the present and projected private airplane requirements, except for Snelling-Hopton area.

Improvement to Merced and Los Banos Municipal Airports is included in the 1947 National Airport Plan and Program. At Merced the improvements are relatively minor to supply standard Class 3 adjuncts; at

Los Banos actual landing facilities are being improved. Recommendation is made that consideration be given now to development of the present Municipal Class 3 facility at Merced to Class 4 by 1950 for the following reasons: This airport is a scheduled stop for United Air Lines between Los Angeles and San Francisco with two flights daily. It is on a natural line of flight, is located on Blue 10 Airway between Fresno and Sacramento. Merced is a popular stop for itinerant pilots on business and pleasure trips. The nearest civil airports are located at Madera 33 miles southeast and Modesto 36 miles northwest. Merced is a contemplated stop on Southwest Airways projected valley route from Los Angeles to Sacramento. It is the policy of this study to recommend Class 3 facilities as minimum feederline and Class 4 as minimum for main airline routine operations. Accomplishment of plans to bring Los Banos Municipal Airport to full standard Class 2 specifications is recommended in this report.

Snelling-Hopton

Recommendation is made for the development of a Class 1 facility by 1955 in the Snelling-Hopton area to include the northeastern sector in the County's airport coverage, filling the gap between the facilities at Turlock and Mariposa and serving the airport needs of non-scheduled aviation.

SAN JOAQUIN COUNTY

Stockton

The city of Stockton is the county seat of San Joaquin County. The population of the County in July, 1946, was 192,000, 90,000 of whom reside within an area of 30 square miles surrounding Stockton. It is estimated that there are 223,000 inhabitants in Stockton's trading area. The County's airport requirements are now served by one Municipal Class 4 at Stockton, one Municipal Class 3 at Lodi and two Municipal Class 3 facilities at Tracy, as well as the following Private installations—Stockton, two S-1, one Class 1 and one S-2; Lodi, two S-2 and Manteca, one Class 1.

Stockton Municipal Airport is located approximately four and one-half miles south-southeast of the city, just west of the Fresno-Sacramento Blue 10 Airway, and on a direct line of flight between Modesto and Sacramento. It is an existing stop on United Air Lines valley route with two daily in and out flights. Stockton is a proposed stop on Southwest Airway projected valley route from Los Angeles to Sacramento. Mention has previously been made in this Area Treatment of the anticipated commercial passenger and freight schedules, and the contemplated use of this location as an alternate to the Bay Area for Trans-Pacific flights. For these reasons, recommendation is made for the improvement of the Stockton Municipal Class 4 to a Class 5 airport by 1950.

The projected private plane ownership of 93 for 1950 and 215 in 1955 in the southeastern section of the

Area will be adequately served for the period under study, by the Stockton Municipal and Manteca facilities, with the two Municipal airports at Tracy conveniently close to handle any overflow. The eastern sector has a small projected plane ownership which can also be adequately served by present installations. The northern sector of the Area with a plane ownership potential of 141 in 1950 and 329 in 1955 is believed to be adequately served to 1955 with the aforementioned private Stockton installations and the municipal and private Lodi facilities. The potential of the western sector is small and the proposed Byron-Brentwood airport could assist in serving the airport requirements of this area.

Both Lodi and Tracy areas are considered adequately served with present facilities and capable of contributing to the airport servicing of the Stockton Metropolitan Area.

STANISLAUS COUNTY

Modesto

Modesto is the county seat of Stanislaus County, located in the highly developed northern section of the San Joaquin Valley. It has a population of over 20,000 and serves a trade area including over four times that many inhabitants. It is now served by a Class 3 municipally owned airport. The 1947 National Airport Plan and Program contemplates improvements to bring the facility to full Class 3 standards including an additional landing strip, paved runway, complete runway lighting, etc. Modesto is an existing stop on United Air Lines valley route and a contemplated stop on Southwest Airways projected valley route, the

projected private airplane ownership is high and cargo potentials here are important. It is recommended that Modesto Municipal Airport be improved and developed to Class 5 standards by 1950.

Waterford-Hickman

It is recommended that consideration be given to a Class 1 facility for this section by 1955 to complete the airport coverage of the County and serve the needs of non-scheduled aviation.

In all other particulars it is believed the airport requirements of Stanislaus County are adequately served by present facilities for the period to 1955.

TUOLUMNE COUNTY

Sonora (Columbia)

Sonora is the county seat of Tuolumne County and is located in a picturesque and historic section of the State—the old Mother Lode mining region which attracts many visitors. The district also possesses many attractions for fishing and hunting enthusiasts. The county has a population of 10,950 as of July, 1946. The Sonora-Columbia airport, a county-owned Class 1 facility is the only airport in Tuolumne County. The 1947 National Airport Plan and Program includes development of this installation to a Class 2 facility, and this report urges the accomplishment of this improvement at an early date, since it is believed necessary to meet the requirements of non-scheduled aviation in the area, serve the needs of air accessibility to recreational areas and fulfill the request of the United States Forest Service for a Class 2 facility at this location.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 8

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Calaveras County San Andreas.....	Valley Springs.....	Private.....	S-1	1	FS,R,NS		
Mariposa County Coulterville.....	Mount Bullion.....	County.....	1	1	FS,R		
Mariposa.....				2	FS,R,NS		
Wawona.....				2	FS,R,NS		
Merced County Los Banos.....		Municipal.....	S-2	2	NS		
Merced.....		Municipal.....	3	4	FE,C,NS,R		
Snelling.....						1	NS
San Joaquin County Stockton.....		Municipal.....	4	5	FE,AP,C,NS		
Stanislaus County Modesto.....		Municipal.....	3	5	FE,C,NS		
Waterford.....						1	NS
Tuolumne County Sonora.....	Columbia.....	County.....	1	2	FS,R,NS		

* Unless otherwise noted, no development required by 1955 if 1950 recommendations are accomplished.

APPENDIX 9

AREA 9—SAN FRANCISCO BAY

NATURAL CHARACTERISTICS

Area 9, a closely knit economic unit, is made up of a fan of nine counties with San Francisco Bay as a center—Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco.

Geography and Topography

The Bay Area, slightly smaller than New Jersey, measures 160 miles northwest to southeast and extends about 50 miles from the coast. It is bounded by Mendocino, Lake, Yolo, Sacramento, San Joaquin, Stanislaus, Merced, San Benito, and Santa Cruz Counties.

The Area is rugged for the most part and covered with three mountain ridges parallel to the coast. The western ridge, next to the Pacific Ocean, reaches heights of 1,000 to 2,000 feet south of San Francisco. Continuing north of the Golden Gate, the ridge includes beautiful Mount Tamalpais—2,586 feet high. The center ridge skirts the eastern shore of the Bay. The third ridge, still further east, reaches an elevation of 3,849 feet at Mount Diablo. Between the ridges lie fertile agricultural valleys famous for their fruit, vegetable, and field crops, and for their poultry and dairy products. Much of the population and industrial development is found on the tip of San Francisco Peninsula and on the coastal plains and tidelands around the southern half of the Bay. San Francisco Bay, 13 miles wide and 60 miles long, is one of the best natural harbors in the world. Into this flow the Sacramento and San Joaquin Rivers after converging at Carquinez Straits. Water transportation is thus provided from the Pacific Ocean to the great inland valleys.

Climate

San Francisco enjoys a remarkably equable and bracing climate. For a period of over 20 years the daily mean temperature has ranged between 50 and 62 degrees. Summers are cool and winters warm compared with the great interior valleys. Although dense fogs occur at certain seasons, there are only 19 such days on

an average per year compared with 167 clear days. Rainfall, occurring mainly in the winter, averages 22 inches.

The East Bay shore has a climate similar to San Francisco's, but slightly warmer in summer and slightly cooler in winter, and with somewhat less fog. The agricultural valleys further inland are protected from ocean breezes and have greater extremes of temperature. In San Jose, for example, average January temperatures range between 38 and 57 degrees and July temperatures between 53 and 80 degrees. The mean annual rainfall is 15 inches. These sheltered valleys have a larger number of completely clear days and their crops mature during a long growing season.

Land Usage

A tabulation of land usage in the Area follows, (From Table 15) :

Land in farms-----	3,086,873	acres	
Land in crops-----	749,916	acres	
Idle cropland-----	835,843	acres	
Woodland and other-----	1,501,113	acres	
Other private land-----	934,419	acres	
Total privately owned land			4,021,292 acres
National forest and parks----	425	acres	
Other public lands-----	450,603	acres	
Total publicly owned lands			451,028 acres
Total land in Area 9-----			4,472,320 acres

Although much of the surface is rugged, it will be seen that over 17 percent of the land—that in the interlying valleys—is under cultivation. The part reserved for national forests and parks is very small. Although sites for industrial purposes are not so abundant as formerly, there is still considerable room for expansion in the North Bay districts and tidelands space further south that can be filled in. Surrounding the intensely industrialized centers are large districts suburban in character. A large percentage of those working in the cities live in these districts and commute to work.

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

Economically, the Bay Area can be considered from three viewpoints: as an important production center with emphasis on agriculture and manufacturing; as a consumption market requiring vast imports to meet the needs of its metropolitan population; and as a distribution and transportation hub, importing and

exporting goods in the Pacific Basin, assembling produce from the northern and central part of the State for transportation to the East, and serving as a buying market for all the western states. Master airport planning for the Area has to make adequate provision for

each of these economic activities and yet integrate any conflicting aeronautical requirements.

Agriculture

The many fertile valleys of the Area—such as the Santa Clara, Sonoma, and Napa—were used by the early settlers for intensive wheat production. Later the growers became interested in orchards, truck crops, and livestock. Specialization has been carried to such an extent today that an entire district is often devoted to one fruit or vegetable.

County	1st	2nd	3rd	4th	5th	6th	7th
Alameda	Flowers	Dairy	Poultry	Nursery	Tomatoes	Sugar Beets	Beef
Contra Costa	Asparagus	Dairy	Apricots	Tomatoes	Beef	Walnuts	Poultry
Marin	Dairy	Beef	Poultry	Nursery	Hay	Artichokes	Peas
Napa	Dairy	Eggs	Grapes	Prunes	Lambs	Beef	Turkeys
San Francisco							
San Mateo	Flowers	Dairy	Hogs	Peas	Lettuce	Artichokes	Brussels sprouts
Santa Clara	Prunes	Beef	Poultry	Dairy	Apricots	Pears	Walnuts
Solano	Sheep	Asparagus	Dairy	Beef	Grain	Prunes	Pears
Sonoma	Eggs-Hens	Dairy	Prunes	Wine Grapes	Hops	Sheep	Apples

Source: California State Chamber of Commerce.

The following tabulation of principal agricultural products according to value gives some indication of these specialties (From Table 24).

Some of the counties were foremost in the State in the value of produce listed. Alameda led in flowers, Santa Clara in apricots and prunes, and Sonoma in wine grapes and eggs.

The diversity of crops produced is illustrated by the following table of the volume of carload shipments from the Area in 1945:

NUMBER OF CARLOADS OUTBOUND IN 1945

Commodity	Alameda	Contra Costa	Marin	Napa	San Francisco	Santa Mateo	Santa Clara	Solano	Sonoma
Apples	3			6			17		1,888
Apples (Dried)	3								143
Apricots	545						4	2	
Asparagus	1	124							
Beans (Snap and Lima)	41						2		
Beets (Edible)						1			
Broccoli							267		
Cabbage						50	3		
Carrots	13				2		20		
Cauliflower	1,103						148		
Celery	70	163					85		
Cherries							395		
Cucumbers							3		
Grapes		434	1	30			27		103
Greens (Except Spinach)							23		
Honeydew Melons		462							
Lettuce and Romaine	58						2		
Mixed Deciduous Fruits	5				2		5	6	
Mixed Melons		1							
Mixed Vegetables	286				22		420		
Onions							28		
Peaches		225						8	
Peaches (Dried)	35	20					119	22	
Pears	10	323					993	54	5
Peas (Green)							142		
Peppers		8					72		
Plums and Fresh Prunes	1						9	56	
Potatoes (White or Irish)		250		7			1		
Prunes (Dried)	49			258			3,309	66	287
Tomatoes	356	465					35		
Turnips and Rutabagas							1		
Total	2,579	2,475	1	301	26	51	6,130	214	2,426
Grand total									14,203

Source: California Carlot Shipments, Fruits and Vegetables, 1945, California Crop and Livestock Reporting Service and Federal-State Market News Service.

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)
(In thousands of dollars)

	1940			1945			Percent change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Alameda.....	11,600	1.72	.14	28,622	1.60	.14	146.74
Contra Costa.....	8,000	1.19	.09	20,956	1.17	.10	161.95
Marin.....	5,100	.76	.06	11,040	.62	.05	116.47
Napa.....	5,000	.74	.06	14,414	.81	.07	188.28
San Francisco.....	1,000	.15	.01	2,045	.11	.01	104.50
San Mateo.....	6,100	.91	.07	15,130	.85	.07	148.03
Santa Clara.....	21,500	3.19	.26	59,595	3.34	.29	177.19
Solano.....	12,300	1.83	.15	28,827	1.61	.14	134.37
Sonoma.....	24,000	3.57	.29	65,422	3.66	.31	172.59
Total Area 9.....	\$94,600	14.06	1.13	\$246,051	13.77	1.18	160.10

Source: California Crop and Livestock Reporting Service. United States totals from *Statistical Abstract of the United States*, 1946.

Certain wartime conditions still existed in 1945. The Area normally produces large crops of strawberries and raspberries. With sufficient farm labor available, large quantities of these berries—an excellent air freight potential—will again be shipped to eastern markets.

The climate of the Area is very favorable to the growth of cut flowers and nursery stock. Alameda, Contra Costa, Marin, and San Mateo Counties all devote considerable acreage to these products. In 1944 Alameda had 4,500 acres in flowers and shrubs and produced crops valued at \$7,452,500. In the same year San Mateo's cut flowers—chrysanthemums, asters, gladioli, violets, ferns, gardenias, and roses—were valued at \$6,728,783. Airplanes have already been used to transport flowers to the East and there is every indication that the practice will become more common.

Many of the local agricultural specialties—fruits, vegetables, and flowers—will find new and wider markets when air freight is fully developed. A potential of such air freight will be given later.

Lumber Production

Lumber production in the Area is negligible. The total stands are estimated at 4,782,000,000 board feet and almost half of this is available for cutting.¹ In 1945, however, only 4,820,000 board feet were cut, all of this in Sonoma County.² The main value of the forests and woods lies in their scenic attractiveness. To protect fully these forests the State and United States forest services have asked for airport facilities as follows:

¹ California Forest and Range Experiment Station, *Forest Survey Release No. 4, March 1, 1946*. (Table 23.)

² United States Department of Agriculture Forest Service, California Forest and Range Experiment Station, *Forest Research Notes, No. 50*. (Table 23.)

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 9 by Counties

Contra Costa County

None.

Marin County

1. Class 2 at Corte Madera—United States Forest Service.

Napa County

1. Class 1 at Monticello—State Division of Forestry.
The State Division of Forestry will use Napa and Calistoga Airports in their existing condition.

San Francisco County

None.

San Mateo County

None.

Santa Clara County

1. Class 1 at San Antonio Creek—State Division of Forestry.
2. Class 2 at Palo Alto—United States Forest Service.
The State Division of Forestry will use two airports at San Jose, Mountain View, Alviso, Milpitas, Morgan Hill and Gilroy in their present condition.

Solano County

None.

Sonoma County

1. Class 1 at Gualala—State Division of Forestry.
2. Class 1 at Stewart's Point—State Division of Forestry.
3. Class 1 at Annapolis—State Division of Forestry.
4. Class 1 at Dry Creek—State Division of Forestry.
5. Class 1 at Cazadero—State Division of Forestry.
6. Class 1 at Wheatfield Fork—State Division of Forestry.
7. Class 1 at The Geysers—State Division of Forestry.
8. Class 1 at Pine Flat—State Division of Forestry.
The State Division of Forestry will use Healdsburg, Windsor, Santa Rosa, Cotati, Sebastopol, Petaluma and Sonoma Fields in their present condition.

Mineral Production

The following table lists the value of minerals—mainly cement, stone, clay, natural gas, and quicksilver—produced in the Area from 1930 to 1945. During this period the Area's percentage of the value of mineral production in the entire State has been constantly increasing.

VALUE OF MINERAL PRODUCTION IN AREA 9

	Mineral Production	Percent of Cali- fornia	Percent of U. S.	Percent Change from Preceding Period
1930				
Alameda.....	\$2,529,337	.69	.06	-----
Contra Costa.....	1,643,286	.45	.03	-----
Marin.....	405,541	.11	.01	-----
Napa.....	532,983	.15	.01	-----
San Francisco.....	23,428	.01	-----	-----
San Mateo.....	2,499,937	.68	.05	-----
Santa Clara.....	884,329	.24	.02	-----
Solano.....	46,638	.01	-----	-----
Sonoma.....	330,399	.09	.01	-----
Total.....	\$8,895,878	2.43	.19	-----
1935				
Alameda.....	\$2,010,493	.76	.06	—20.51
Contra Costa.....	1,361,616	.52	.04	—17.14
Marin.....	113,914	.04	-----	—71.91
Napa.....	198,156	.08	.01	—62.82
San Francisco.....	892	-----	-----	—96.19
San Mateo.....	1,590,159	.60	.04	—36.39
Santa Clara.....	312,676	.12	.01	—64.64
Solano.....	5,450	.01	-----	—88.31
Sonoma.....	170,800	.06	-----	—48.30
Total.....	\$5,764,156	2.19	.16	—35.20
1940				
Alameda.....	\$3,697,648	1.08	.07	83.92
Contra Costa.....	1,960,631	.57	.04	43.99
Marin.....	151,800	.04	-----	33.26
Napa.....	829,589	.24	.01	318.65
San Francisco.....	52,205	.02	-----	5,752.57
San Mateo.....	2,620,611	.76	.05	64.80
Santa Clara.....	3,229,052	.94	.06	932.71
Solano.....	709,435	.21	.01	12,917.16
Sonoma.....	432,760	.13	.01	153.37
Total.....	\$13,683,731	3.99	.25	137.39
1945				
Alameda.....	\$6,661,939	1.41	-----	80.17
Contra Costa.....	2,496,533	.53	-----	27.33
Marin.....	491,435	.10	-----	223.74
Napa.....	628,974	.13	-----	—24.18
San Francisco.....	75,172	.02	-----	43.99
San Mateo.....	2,363,508	.50	-----	—9.81
Santa Clara.....	5,810,388	1.23	-----	79.94
Solano.....	5,282,725	1.11	-----	644.64
Sonoma.....	807,122	.17	-----	86.51
Total.....	\$24,617,796	5.20	-----	79.91

Source: *Minerals Yearbook Review of 1940*, California Division of Mines Bulletins, California State Chamber of Commerce.

Fishing

Fishing is an important source of wealth for the Area. In 1943 the catch amounted to 180,937,195 pounds, or 16 percent of the State total.¹ A large per-

centage of this was canned and most of the remainder consumed locally. Air freight will enable inhabitants of the Rocky Mountain and Midwestern states to enjoy the same delicacies that are served at the restaurants on San Francisco's waterfront.

Tourist and Travel Industry

The Bay Area offers a wide variety of recreational facilities appealing to tourists, vacationists, and sportsmen. Visitors can choose the theatres and world famous restaurants of a metropolitan city, or boating, swimming, and fishing at country and river resorts. Numerous sanitariums have been established in the country districts so that invalids can take full advantage of the pleasant climate and hot springs. The beautiful woods and mountain trails of the state and national parks attract many visitors each year. In 1946 Muir Woods had 264,287 visitors compared with 133,517 in 1941.² The volume of visitors to the state parks in 1946 was as follows, (Table 18) :

	Number of Visitors
Contra Costa County	
Mt. Diablo	79,211
Marin County	
Mt. Tamalpais	46,475
San Francisco County	
James D. Phelan Beach.....	75,000
San Mateo County	
Portola Park	8,562
Sonoma County	
Armstrong Redwoods	178,450
Fort Ross Historical Monument..	16,888
Kruse Rhododendron	15,000
Sonoma Coast	61,990
Sonoma Mission	36,080
Vallejo Home Historical Monument	16,223
	<hr/> 324,631
	533,879

Source: California Department of Natural Resources, Division of Beaches and Parks.

The river resorts, especially those on the Russian River, have long been one of the favorite vacation spots for Californians. The increasing use of airplanes should make these playgrounds available to additional thousands. Both the metropolitan districts and the country resorts can anticipate an increase in the volume of visitors when air passenger service is expanded and when better provision is made for private aircraft.

Manufacturing

Manufacturing is very important in the economy of the Bay Area—important in the number of persons employed, in the amount of payrolls, and in the value of products. The following table indicates the number of industries, the number of wage earners, the amount of wages, and the value of products in 1939, the latest year for which data is available.

¹ State of California Department of Natural Resources, *Thirty-eighth Biennial Report of the Division of Fish and Game*.
² Department of the Interior, National Park Service.

MANUFACTURING IN AREA 9, 1939

Industry Group	Alameda	Contra Costa	Marin	Napa	San Francisco	San Mateo	Santa Clara	Solano	Sonoma	Area 9 Total
Food and Kindred Products.....	302	36	30	40	489	37	174	27	143	1,278
Tobacco Manufactures.....	1				12					13
Textile-mill Products.....	8	1			23				1	33
Apparel and Other Finished Products..	21	1		2	283		14	1	1	312
Lumber and Timber Basic Products....	35	2	3	1	31	10	5	1	9	97
Furniture and Finished Lumber Products.....	70	4		1	129	2	14	1	2	223
Paper and Allied Products.....	12	3		1	27		1		2	46
Printing, Publishing, and Allied.....	96	14	8	7	434	12	36	8	11	626
Chemicals and Allied Products.....	88	35	3		109	14	12	1	2	264
Products of Petroleum and Coal.....	3	8			2					13
Rubber Products.....	6	1			5		1			13
Leather and Leather Products.....	8		2	3	33	3	1		2	52
Stone, Clay, and Glass Products.....	36	8	1	2	50	13	15		3	128
Iron and Steel and Their Products.....	82	7	1		122	8	14		2	236
Nonferrous Metals and Their Products	43	2	1		136	1	6		2	191
Electrical Machinery.....	22				25	3	1			51
Machinery (except Electrical).....	91		2	3	125	5	19	1	3	249
Automobiles and Automobile Equipment	12	1			16	1	4			34
Trans. Equipment except Automobiles..	10	3	3		17			2	1	36
Miscellaneous Industries.....	32				104	2	6		1	145
Total Establishments.....	978	126	54	60	2,172	111	312	42	185	4,040
Wage Earners.....	27,040	13,787	271	721	31,789	3,488	9,316	753	1,564	88,729
Wages in Thousands.....	\$37,888	\$22,124	\$362	\$688	\$44,723	\$5,866	\$10,036	\$1,076	\$1,613	\$124,376
Value of Products in Thousands.....	\$282,405	\$314,344	\$2,789	\$4,450	\$313,252	\$47,845	\$78,074	\$16,037	\$17,250	\$1,076,446

Source: United States Census of Manufactures.

There was an immense expansion of industry during the war. Thousands of workers were attracted from other local industries and from other states to work in the shipyards. The number working today at shipbuilding and repair is far below the wartime peak but shipbuilding is still the second largest industry in the Area in the number of workers employed.

The following data on manufacturing trends in the San Francisco-Oakland Industrial Area gives some indication of the development in the entire Bay Area since the 1939 Census.

Year	Employment	Payrolls
1939	91.1	89.2
1940	100.0	100.0
1941	132.6	156.3
1942	234.1	372.9
1943	332.0	603.5
1944	302.7	576.4
1945	206.1	380.1
1940—100 Index		

Source: California Department of Industrial Relations.

Employment in the printing and publishing industry in the San Francisco-Oakland Area in April 1946 was 1.4 percent above 1940 and payrolls were 67.3 percent higher. In the chemical and allied products industries employment had increased 19.6 percent and payrolls 102 percent over the 1940 levels. In the apparel industry the output of men's clothing was less, but the number of workers employed in manufacturing women's clothing was 132 percent greater.

The amount of manufactured products transported from the Area by air will be large. A high percentage

of air freight and express to date has been made up of this sort of goods. The printing, chemical, leather and leather products and the electrical machinery industries are especially likely to benefit by the development of air transportation.

Distribution and Transportation

Transportation routes radiate fanwise from a center at San Francisco and Oakland. Three transcontinental railroads—the Southern Pacific, the Atchison, Topeka and Santa Fe, and the Western Pacific—have terminals here. The Northwestern Pacific Railway connects Marin County with the northern part of the State. The main coast line of the Southern Pacific runs southward from San Francisco and other branch lines and electric railways provide complete railway service for the entire Area.

Highways follow the same general pattern. Routes No. 1 and 101 stretch northward; Nos. 24, 40 and 50 connect with the great interior valley, and four highway run southward from San Francisco. The Bay cities are knit into a single economic unit by the Golden Gate and San Francisco-Oakland Bay Bridges which obviate lengthy detours in traveling from one highway to another, and provide San Francisco with direct access to the north and east. Thirty truck lines and four transcontinental bus companies operate out of San Francisco. Numerous local bus services aid in transporting the thousands of workers who commute daily to work. At night the highways are crowded with trucks

carrying in food and supplies for the metropolitan population.

Both the railroads and highways converge at the extensive port facilities of San Francisco Bay. On the west, the Golden Gate faces the Pacific and 177 steamship lines transport goods and passengers to and from the Orient and the Pacific Coast of North and South America. The State-owned Port of San Francisco has 43 modern piers. The Port of Oakland-Alameda, where most of the bay frontage is owned by the City of Oakland, boasts 23 large wharves. The more recently developed Port of Richmond has four new terminals.

In 1940 the Bay Ports handled 22,560,098 tons of ocean cargo and 8,272,193 additional tons of local freight (Table 30), thus making the Area second in the United States in tonnage of water-borne commerce. In the same year \$211,992,000 worth of imports and exports went through the San Francisco Customs District. The principal exports were petroleum, fresh and processed fruits, grains, machinery, and chemicals. The main imports were copra, sugar, coffee, newsprint, vegetable oils, and chemicals. In 1946 water-borne exports and imports totaled 5,880,400,000 pounds valued at \$501,000,000. (Table 87)

Airport facilities in the Area will be taken up later. The only needs to be mentioned here are that aeronautical developments will have to meet the demands of the exporting and importing center of a vast marketing district. Railroads and highways have been constructed to conform with the requirements of one of the main distribution hubs on the Pacific Coast. Airplane facilities have to be planned with a similar purpose in mind. Adequate provision must be made for international cargo and passenger flights.

Indices of Purchasing Power

The Bay Area ranks first in the State as a financial and securities center. In 1944, when the population made up 27 percent of the State total, bank deposits were 37.41 percent of the California total. In this same year per capita bank deposits were over 185 percent of the State per capita deposits. Per capita individual incomes in 1940 and 1945 were well above the State average. In the latter year, the per capita retail sales were more than 50 percent higher than the State mean. There is every indication that the Bay Area has sufficient wealth to finance the airport facilities needed. The indices are listed in Table 116.

TABLE 116
INDICES OF PURCHASING POWER FOR AREA 9
Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Alameda.....	\$602,733,625	\$1,269	70.62	-----	\$434,010,554	\$901	82.74	-29.00
Contra Costa.....	116,053,724	1,476	82.14	-----	117,331,820	1,367	125.53	-7.39
Marin.....	41,268,464	991	55.15	-----	44,347,247	952	87.42	-3.94
Napa.....	31,533,227	1,377	76.63	-----	22,866,475	961	88.25	-30.21
San Francisco.....	1,742,459,743	2,747	152.87	-----	813,129,601	1,284	117.91	-53.26
San Mateo.....	72,721,775	939	52.25	-----	104,648,203	1,119	102.75	+19.17
Santa Clara.....	146,760,202	1,011	56.26	-----	145,432,935	935	85.86	-7.52
Solano.....	43,183,175	1,058	58.88	-----	39,523,165	940	86.32	-11.15
Sonoma.....	56,309,054	905	50.36	-----	62,149,075	986	90.54	+8.95
Totals.....	\$2,853,022,989	\$1,808	100.61	-----	\$1,783,439,075	\$1,097	100.73	-39.33
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Alameda.....	\$455,205,215	\$887	85.87	-1.55	\$525,853,755	\$712	50.71	-19.73
Contra Costa.....	132,283,380	1,317	127.49	-3.66	197,996,665	749	53.35	-43.13
Marin.....	49,065,847	927	89.74	-2.63	55,829,637	724	51.57	-21.90
Napa.....	24,026,422	843	81.61	-12.28	31,692,685	742	52.85	-11.98
San Francisco.....	820,546,398	1,293	125.17	.70	846,625,476	1,092	77.78	-15.55
Santa Clara.....	159,127,190	910	88.09	-2.67	205,055,945	915	65.17	.55
San Mateo.....	119,834,211	1,072	103.78	-4.20	143,870,838	808	57.55	-24.63
Solano.....	42,888,643	873	84.51	-7.13	66,564,320	559	39.81	-35.97
Sonoma.....	66,470,593	963	93.22	-2.33	77,094,555	928	66.10	-3.64
Totals.....	\$1,869,447,899	\$1,078	104.36	-1.73	\$2,150,583,876	\$859	61.18	-20.32

TABLE 116—Continued
 INDICES OF PURCHASING POWER FOR AREA 9
 Per Capita Individual Incomes^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Alameda.....	\$419,905	\$819	101.99	\$1,073,910	\$1,453	105.75	77.41
Contra Costa.....	65,473	652	81.20	295,986	1,119	81.44	71.63
Marin.....	28,595	540	67.25	85,040	1,102	80.20	104.07
Napa.....	17,118	601	74.84	46,353	1,086	79.04	80.70
San Francisco.....	812,754	1,281	159.53	1,649,549	2,128	154.88	66.12
San Mateo.....	88,169	789	98.26	196,941	1,106	80.49	40.18
Santa Clara.....	115,188	658	81.94	252,523	1,127	82.02	71.28
Solano.....	46,775	952	118.56	174,495	1,466	106.70	53.99
Sonoma.....	35,213	510	63.51	83,310	1,003	73.00	96.67
Totals.....	\$1,629,190	\$939	116.96	\$3,858,107	\$1,542	112.23	64.22

Per Capita Retail Sales^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Alameda.....	\$264,733	\$557	98.41	-----	\$193,690	\$402	104.96	—27.83
Contra Costa.....	28,588	364	64.31	-----	23,728	277	72.32	—23.90
Marin.....	15,286	367	64.84	-----	11,740	252	65.80	—31.34
Napa.....	10,094	441	77.92	-----	7,965	335	87.47	—24.04
San Francisco.....	474,683	748	132.16	-----	298,371	471	122.98	—37.03
San Mateo.....	31,440	406	71.73	-----	24,513	262	68.41	—35.47
Santa Clara.....	77,032	531	93.82	-----	51,542	331	86.42	—37.67
Solano.....	16,516	404	71.38	-----	13,389	319	83.29	—21.04
Sonoma.....	48,465	779	137.63	-----	26,983	428	111.75	—45.06
Totals.....	\$966,837	\$613	108.30	-----	\$651,921	\$401	104.70	—34.58
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Alameda.....	\$250,580	\$488	105.86	21.39	\$551,589	\$1,075	145.47	120.29
Contra Costa.....	34,397	342	74.19	23.46	131,511	1,309	177.13	282.75
Marin.....	18,448	349	75.70	38.49	38,058	719	97.29	106.02
Napa.....	11,426	401	86.98	19.70	23,767	834	112.86	107.98
San Francisco.....	383,554	604	131.02	28.24	846,081	1,333	180.38	120.70
San Mateo.....	43,452	389	84.38	48.47	91,644	820	110.96	110.80
Santa Clara.....	79,769	456	98.92	37.76	147,453	843	114.07	84.87
Solano.....	19,005	387	83.95	21.32	66,482	1,354	183.22	249.87
Sonoma.....	35,765	518	112.36	21.03	54,973	796	107.71	53.67
Totals.....	\$876,396	\$505	109.54	25.94	\$1,951,558	\$1,125	152.23	122.77

Source: ^a United States Treasury Department.

^b California State Chamber of Commerce.

^c Statements, Controller's Department.

^d State of California. Division of Motor Vehicles.

CALIFORNIA AIRPORTS

TABLE 116—Continued
 INDICES OF PURCHASING POWER FOR AREA 9
 Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
 (In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Alameda.....	\$301,276	7.08	\$403,931	7.34	\$542,905	7.55	\$654,997	7.55
Contra Costa.....	36,671	.86	56,098	1.02	84,445	1.17	115,878	1.34
Marin.....	18,289	.43	25,655	.47	33,784	.47	44,447	.51
Napa.....	12,956	.30	18,788	.34	24,790	.35	29,100	.34
San Francisco.....	1,319,990	31.01	1,540,186	27.98	1,823,726	25.37	1,986,610	22.90
San Mateo.....	39,692	.93	51,834	.94	73,557	1.02	93,437	1.08
Santa Clara.....	77,289	1.82	102,177	1.86	144,204	2.01	183,110	2.11
Solano.....	24,483	.57	34,946	.63	44,391	.62	57,828	.66
Sonoma.....	34,867	.82	46,373	.84	64,872	.90	80,140	.92
Totals.....	\$1,865,513	43.82	\$2,279,988	41.42	\$2,836,674	39.46	\$3,245,547	37.41

Per Capita Automobile and Truck Registrations ^a—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Alameda.....	145,696	.31	86.11	-----	152,965	.32	91.43	3.23
Contra Costa.....	25,395	.32	88.89	-----	28,491	.33	94.29	3.13
Marin.....	11,348	.27	74.00	-----	13,586	.29	82.86	7.41
Napa.....	8,088	.35	97.22	-----	8,876	.37	105.71	5.71
San Francisco.....	155,888	.25	69.44	-----	154,498	.24	68.57	-4.00
San Mateo.....	25,660	.33	91.67	-----	31,439	.34	97.14	3.03
Santa Clara.....	56,699	.39	108.33	-----	62,244	.40	114.29	2.56
Solano.....	13,951	.34	94.44	-----	14,723	.35	100.00	2.94
Sonoma.....	27,085	.44	122.22	-----	28,197	.45	128.57	2.27
Totals.....	469,810	.30	83.33	-----	495,019	.30	85.71	2.85
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Alameda.....	193,571	.38	95.00	18.75	201,826	.27	87.10	-28.95
Contra Costa.....	39,968	.40	100.00	21.21	68,630	.26	83.87	-35.00
Marin.....	17,979	.34	85.00	17.24	20,438	.26	83.87	-23.53
Napa.....	11,341	.40	100.00	8.11	13,603	.32	103.23	-20.00
San Francisco.....	192,398	.30	75.00	25.00	179,755	.23	74.19	-23.33
San Mateo.....	44,211	.40	100.00	17.65	50,181	.28	90.32	-30.00
Santa Clara.....	76,431	.44	110.00	10.00	75,449	.34	109.68	-22.73
Solano.....	19,748	.40	100.00	14.28	30,586	.26	83.87	-35.00
Sonoma.....	32,113	.47	118.00	4.44	32,450	.39	125.81	-17.02
Totals.....	627,780	.36	90.00	20.00	672,948	.27	87.10	-25.00

Population

Table 117 shows the population of the Area by five year periods from 1930 through 1945 with estimated totals for 1950 and 1955. It will be noted that the proportion of the Area's population to the State's population is fairly consistent throughout this period. There was a phenomenal influx of workers into the Area during the war to man the shipyards. This fact is illustrated by Table 118, which lists the growth of the cities in the Area. When the war was over, a considerably smaller percentage of these out-of-state workers returned home than had been anticipated.

As a metropolitan marketing, distributing, and trade center, the Bay Area has special aeronautical requirements. Like other aviation areas in the State, this Area will need adequate air freight service to ship its agricultural and manufactured produce. In addition, provision will have to be made for air exports

and imports. Since it is a vast consuming market, inbound freight, at the start, may exceed that of the outbound. There is some evidence that westbound freight from New York has been piling up at the eastern air terminals. Wholesale and retail trade are major economic activities in the Area. Chain stores and retail associations have already contracted with non-scheduled carriers for regular deliveries from the east by airplane and the use of such transportation will increase. The businessmen of the Area need good air passenger service to other parts of the State and to the eastern and midwest industrial centers. In the future, many of them may travel by private airplane. There should also be a good market for private aircraft among the wealthy suburbanites. The Area's master airport plan also has to make provision for the requirements of tourists from this country and from abroad. The aeronautical appraisal of the Area will now be discussed in detail.

TABLE 117
POPULATION OF AREA 9 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930 ^a				1945 ^d			
Alameda.....	474,883	8.37	-----	Alameda.....	739,000	8.14	44.05
Contra Costa.....	78,608	1.39	-----	Contra Costa.....	264,500	2.91	163.32
Marin.....	41,648	.73	-----	Marin.....	77,150	.85	45.82
Napa.....	22,897	.40	-----	Napa.....	42,700	.47	49.81
San Francisco.....	634,394	11.17	-----	San Francisco.....	775,000	8.53	22.14
San Mateo.....	77,405	1.36	-----	San Mateo.....	178,000	1.96	59.24
Santa Clara.....	145,118	2.56	-----	Santa Clara.....	224,000	2.47	28.04
Solano.....	40,834	.72	-----	Solano.....	119,000	1.31	142.27
Sonoma.....	62,222	1.10	-----	Sonoma.....	83,100	.91	20.34
Total Area 9.....	1,578,009	27.80	-----	Total Area 9.....	2,502,450	27.55	44.29
1935 ^b				1950 ^e			
Alameda.....	481,545	7.92	1.40	Alameda.....	767,500	7.73	3.86
Contra Costa.....	85,815	1.41	9.17	Contra Costa.....	265,000	2.67	.19
Marin.....	46,595	.76	11.87	Marin.....	80,500	.81	4.34
Napa.....	23,805	.39	3.97	Napa.....	45,250	.46	5.97
San Francisco.....	633,195	10.41	— .19	San Francisco.....	838,250	8.44	8.16
San Mateo.....	93,505	1.54	20.80	San Mateo.....	198,150	1.99	11.32
Santa Clara.....	155,560	2.56	7.20	Santa Clara.....	242,000	2.44	8.04
Solano.....	42,030	.69	2.93	Solano.....	127,500	1.28	7.14
Sonoma.....	63,045	1.03	1.32	Sonoma.....	90,000	.90	8.30
Total Area 9.....	1,625,095	26.71	2.98	Total Area 9.....	2,654,150	26.72	6.06
1940 ^c				1955 ^f			
Alameda.....	513,011	7.43	6.53	Alameda.....	837,000	7.53	9.06
Contra Costa.....	100,450	1.45	17.05	Contra Costa.....	290,000	2.61	9.43
Marin.....	52,907	.77	13.55	Marin.....	87,000	.78	8.07
Napa.....	28,503	.41	19.74	Napa.....	49,875	.45	10.22
San Francisco.....	634,536	9.19	.21	San Francisco.....	898,375	8.08	7.17
San Mateo.....	111,782	1.62	19.55	San Mateo.....	226,575	2.04	14.35
Santa Clara.....	174,949	2.53	12.46	Santa Clara.....	264,500	2.38	9.30
Solano.....	49,118	.71	16.86	Solano.....	140,000	1.26	9.80
Sonoma.....	69,052	1.00	9.53	Sonoma.....	98,175	.88	9.08
Total Area 9.....	1,734,308	25.11	6.72	Total Area 9.....	2,891,500	26.01	8.94

Source: Same as Table 93, Page 244.

TABLE 118
POPULATION STATISTICS OF AREA 9
Incorporated Places

Aviation Area, Counties and Cities	Date Incor- porated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 9		658,111	925,708	1,182,911	1,578,009	1,734,308	†2,487,200	
Alameda County		130,197	246,131	344,177	474,883	513,011	†700,000	
*Alameda	1854	16,464	23,383	28,806	35,033	36,256	89,906	May 9, 1945
*Albany	1908		808	2,462	8,569	11,493	14,873	June 19, 1944
*Berkeley	1878	13,214	40,434	56,036	82,109	85,547	100,024	Mar. 12, 1944
*Emeryville	1896	1,016	2,613	2,390	2,336†	2,521		
*Hayward		1,965	2,746	3,487	5,530	6,736	8,243	Dec. 4, 1945
*Livermore	1876	1,493	2,030	1,916	3,119	2,885	3,622	April 6, 1944
*Oakland	1852	66,960	150,174	216,261	284,063	302,163	400,935	Oct. 9, 1945
*Piedmont	1907		1,719	4,282	9,333	9,866	10,678	Feb. 26, 1946
Pleasanton	1894	1,100	1,254	991	1,237	1,278	2,388	June 16, 1944
*San Leandro	1872	2,253	3,471	5,703	11,455	14,601	22,903	April 24, 1944
Contra Costa County		18,046	31,674	53,889	78,608	100,450	†300,000	
*Antioch	1872	674	1,124	1,936	3,563	5,106	7,255	Dec. 8, 1943
Concord	1905		703	912	1,125	1,373	3,940	Mar. 27, 1944
*El Cerrito	1917			1,505	3,870	6,137	16,624	Nov. 13, 1943
Hercules	1900		279	373	392	343		
*Martinez	1876	1,380	2,115	3,858	6,569	7,381		
Pinole	1903		798	967	781	934		
*Pittsburg	1903		2,372	4,715	9,610	9,520	10,841	Mar. 16, 1944
*Richmond	1905		6,802	16,843	20,093	23,642	93,738	Sept. 14, 1943
Walnut Creek	1914			538	1,014	1,578		
Marin County		15,702	25,114	27,342	41,648	52,907	†75,000	
Belvedere	1896	434	481	616	500	457	691	Oct. 25, 1945
Corte Madera	1916			607	1,027	1,098	1,512	June 12, 1945
Fairfax	1931					2,198	3,005	June 23, 1945
Larkspur	1908		594	612	1,241	1,558	2,549	Dec. 5, 1945
*Mill Valley	1900		2,551	2,554	4,164	4,847	6,119	June 11, 1945
Ross	1908		556	727	1,355	1,751		
*San Anselmo	1907		1,531	2,476	4,650	5,790	7,125	June 18, 1945
*San Rafael	1874	3,879	5,934	5,512	8,022	8,573	11,389	June 11, 1945
*Sausalito	1893	1,628	2,383	2,790	3,667	3,540	4,719	June 5, 1945
Napa County		16,451	19,800	20,678	22,897	28,503	†42,700	
Calistoga	1886	690	751	850	1,000	1,124		
*Napa	1872	4,036	5,791	6,757	6,437	7,740	12,987	Mar. 20, 1944
St. Helena	1876	1,582	1,603	1,346	1,582	1,758		
San Francisco County		342,782	416,912	506,676	634,394	634,536	†750,000	
*San Francisco	1850	342,782	416,912	506,676	634,394	634,536	827,400	Aug. 1, 1945
San Mateo County		12,094	26,585	36,781	77,405	111,782	†175,000	
Atherton	1923				1,242	1,908		
Belmont	1926				984	1,229	2,257	Sept. 23, 1943
*Burlingame	1908		1,565	4,107	13,270	15,940	17,395	April 11, 1944
Colma	1924					354		
*Daly City	1911			3,779	7,838	9,625	11,666	June 22, 1946
*Hillsborough	1910			931	1,891†	2,747		
*Menlo Park	1927				2,254†	3,258	7,180	April 2, 1946
*Redwood City	1868	1,653	2,442	4,020	8,962	12,453	14,662	Sept. 15, 1943
*San Bruno	1914			1,562	3,610	6,519	15,178	Oct. 15, 1943
*San Carlos	1925				1,132†	3,520	6,311	Sept. 15, 1943
*San Mateo	1894	1,832	4,384	5,979	13,444	19,403	26,804	May 1, 1944
*South San Francisco	1908		1,989	4,411	6,193	6,629	11,406	Mar. 1, 1944

TABLE 118—Continued
POPULATION STATISTICS OF AREA 9
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Santa Clara County		60,216	83,539	100,676	145,118	174,949	†243,000	
Alviso	1852		402	517	381	677		
*Gilroy	1870	1,820	2,437	2,862	3,502	3,615	4,388	May 13, 1946
*Los Gatos	1887	1,915	2,232	2,317	3,168	3,597		
Mayfield			1,041	1,127	Annexed to Palo Alto Township			
Morgan Hill	1906		607	646	908	1,014		
*Mountain View	1902		1,161	1,888	3,308	3,946		
*Palo Alto	1894	1,658	4,486	5,900	13,652	16,774	18,261	May 20, 1944
*San Jose	1850	21,500	28,946	39,642	57,651	68,457	80,734	July 24, 1946
*Santa Clara	1866	3,650	4,348	5,220	6,302	6,650		
*Sunnyvale	1912			1,675	3,094	4,373	6,424	Mar. 21, 1944
Solano County		24,143	27,559	40,602	40,834	49,118	†112,500	
Benicia	1850	2,751	2,360	2,693	2,913	2,419	8,368	April 19, 1944
Dixon		783	827	926	1,000	1,108	1,134	April 19, 1944
Fairfield	1903		834	1,008	1,131	1,312	1,802	April 19, 1944
Rio Vista	1894	682	884	1,104	1,309	1,666	1,682	April 19, 1944
Suisun	1869	625	641	768	905	706	1,240	April 19, 1944
Vacaville	1892	1,220	1,177	1,254	1,556	1,614	2,244	April 19, 1944
*Vallejo	1866	7,965	11,340	21,107	16,072	20,072	42,941	April 19, 1944
Sonoma County		38,480	48,394	52,090	62,222	69,052	†89,000	
Cloverdale	1872	750	823	718	759	809		
*Healdsburg	1868	1,869	2,011	2,412	2,296†	2,507	2,885	Sept. 6, 1946
*Petaluma	1858	3,871	5,880	6,226	8,245	8,034	9,559	Dec. 31, 1943
*Santa Rosa	1868	6,673	7,817	8,758	10,636	12,605	14,931	Jan. 24, 1946
Sebastopol	1902		1,233	1,493	1,762	1,856	2,115	May 15, 1946
Sonoma	1850	652	957	801	980	1,158	1,537	May 8, 1946

* URBAN—1940.

† Estimate of California Taxpayers' Association.

‡ Classification changed to urban in this interval.

Unincorporated Places

Popula- tion	Popula- tion	Popula- tion
Alameda County	Danville	Green Brae
Alvarado	Diablo	Ignacio
1,800	300	152
Ashland District	Giant	Inverness
5,000	125	225
Castro Valley	Hercules	Kentfield
4,145	400	1,350
Centerville	Knightson	Lagunitas
1,846	125	370
Cherryland	Lafayette	Marin City
675	1,227	5,006
Decoto	Moraga	Nicasio
1,762	800	150
Dublin	Nichols	Novato
225	350	1,120
Fiddletown	Oakley	Oleuma
250	800	155
Irvington	Oleum	Point Reyes Station
894	250	155
Mission San Jose	Orinda	San Quentin
849	782	320
Mount Eden	Pacheco	Stinson Beach
450	200	170
Newark	Port Chicago	Tiburon
1,522	1,032	350
Niles	Port Costa	Tomales
2,104	700	450
San Lorenzo	Rodeo	Woodacre
6,125	1,931	100
Sunol	St. Mary's College	
625	800	
Warm Springs	San Pablo	
1,000	3,839	
Contra Costa County	San Ramon	Napa County
Avon	Selby	Angwin
275	200	300
Brentwood	Steger	Montecello
2,569	700	125
Byron	Marin County	Oakville
1,000	Angel Island	225
Clayton	Black Point	Pope Valley
175	125	200
Clyde	Bolinas	Rutherford
175	200	325
Cowell	Forest Knolls	Yountville
125	250	517
Crockett		San Francisco County
4,105		None

TABLE 118—Continued
POPULATION STATISTICS OF AREA 9
Unincorporated Places

	Popula- tion		Popula- tion		Popula- tion
San Mateo County		Campbell	2,032	Cotati	1,000
Bayshore	734	Coyote	125	El Verano	796
Brisbane	1,902	Cupertino	2,600	Fetters Hot Springs	100
Colma	1,355	Evergreen	300	Forestville	525
East Palo Alto	1,700	Lawrence	425	Freestone	100
El Granada	150	Los Altos	1,171	Fulton	250
Half Moon Bay	850	Milpitas	475	Geyserville	625
Hillsdale	2,000	San Martin	400	Glen Ellen	250
La Honda	200	Saratoga	890	Groton	450
Lomita Park	1,328	Stanford University	800	Guerneville	1,089
Mill Brae	2,623	Wayne	275	Hilton	125
Montara	175			Jenner	175
Moss Beach	425	Solano County		Kenwood	155
Pedro Valley	150	Collinsville	100	Lytton	225
Pescadero	525	Cordelia	175	Monte Rio	525
Rockaway Beach	250	Denverton	135	Occidental	375
San Gregorio	175	Elmira	200	Penngrove	175
Sharp Park	834	Floresden	200	Rio Nido	300
Visitacion	150			Shellville	100
Woodside	500	Sonoma County		Valley Ford	225
Santa Clara County		Agua Caliente	418	Venado	125
Agnew	300	Bodega	100	Vineburg	100
Alma	300	Boyes Hot Springs	400	Windsor	1,047
Almaden	100	Camp Meeker	125		
		Cazadero	150		

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

Although the San Francisco Bay Area has maintained a high level of aeronautical activity for many years, and has often taken the lead in new adaptations of aviation to private and business needs, this progress and leadership have not been the result of concomitant development of airports, but rather progress made in spite of increasingly less adequate facilities. The same courage, foresight, and pertinacity, however, which succeeded against all obstacles in metamorphosing useless mudflats and tideland into a modern Class 7 airport of 800 acres, with an 8,000 foot runway and capable of handling over 500 landings and take-offs a day, can, if judiciously applied, rapidly improve the Bay Area's position of last in the State in airport adequacy (See Table 55). "Judiciously applied" connotes master

airport planning for the entire Area by some representative, unified agency which can evaluate accurately the Area's requirements and make definite proposals to the Counties with indications of timing best suited to the Area's needs as a unit.

The following tabulation lists all existing airports in the Bay Area. These airports are attempting at present to serve several purposes, often conflicting. They have to handle a constantly increasing volume of scheduled airline operations—interstate, intrastate, and international. They have to meet the growing demands of private aircraft owners, both local and visiting. Some of them, Army and Navy Air Bases at strategic locations, are necessary for national defense:

Plate M-8 Code	City and Airport Name	Ownership	Class
SAN FRANCISCO COUNTY			
9- 25	San Francisco Airport (in San Mateo County)		
SAN MATEO COUNTY			
9- 25	San Bruno-San Francisco Municipal	City and County of San Francisco	7
9- 26	Half Moon Bay	County of San Mateo	4
9- 27	Palo Alto Municipal	City of Palo Alto	1
9- 50	Belmont	Commercial-Private	S-2
9- 51	San Carlos-Patton	Commercial-Private	1
9- 52	San Carlos-Cooley	Commercial-Private	1
9- 53	San Mateo-Bay Meadows	Commercial-Private	S-2
9- 54	San Mateo	Commercial-Private	S-1
9- 55	Redwood City	Private	S-3

Plate M-8 Code	City and Airport Name	Ownership	Class
SANTA CLARA COUNTY			
9- 1	Mountain View-Moffett NAS	United States Navy	6
9- 27	Palo Alto-Municipal	(Airport in San Mateo County)	
9- 29	San Jose-Municipal	Commercial-Private	1
9- 60	Gilroy	Commercial-Private	S-2
9- 61	Los Gatos-Ames	Commercial-Private	S-1
9- 62	Morgan Hill-Valley Airport	Commercial-Private	S-1
9- 63	Mountain View	Commercial-Private	S-2
9- 64	San Jose-Pacific Airmotive	Commercial-Private	S-2
9- 65	San Jose-Reid-Hillview	Commercial-Private	S-2
9- 66	Warm Springs	Commercial-Private	S-2
ALAMEDA COUNTY			
9- 3	Alameda NAS	United States Navy	4
9- 4	Livermore NAS	United States Navy	3
9- 5	Livermore NOLF	United States Navy	2
9- 32	Oakland Municipal	Port of Oakland	5
9- 33	Hayward Municipal (AAFld)	City of Hayward	5
9- 70	Centerville-Center Field	Commercial-Private	S-2
9- 71	Livermore	Commercial-Private	1
9- 66	Warm Springs	(Airport in Santa Clara County)	
CONTRA COSTA COUNTY			
9- 8	Concord NOLF	United States Navy	3
9- 36	Concord-Buchanan Field	County of Contra Costa	4
9- 37	Martinez Airpark	City of Martinez	1
9- 74	Antioch-Sky Vale	Commercial-Private	S-1
9- 75	Antioch	Commercial-Private	S-1
9- 76	San Ramon	Commercial-Private	S-2
9- 77	Walnut Creek-Sherman	Commercial-Private	S-2
SOLANO COUNTY			
9- 10	Fairfield-Fairfield-Suisun	United States Army	6
9- 80	Benicia-South Hampton Bay	Commercial-Private	1
9- 81	Dixon	Commercial-Private	1
9- 82	Fairfield-Airpark	Commercial-Private	S-2
9- 83	Vallejo-Skyharbor	Commercial-Private	S-2
9- 84	Vallejo-Stan's Airpark	Commercial-Private	1
9- 85	Vacaville-Vaca-Dixon	Commercial-Private	1
9- 86	Rio Vista	Commercial-Private	1
NAPA COUNTY			
9- 40	Napa County	County of Napa	4
9- 90	Napa Sky Ranch	Commercial-Private	1
9- 91	Calistoga	Commercial-Private	1
9- 92	Aetna Springs	Private	S-1
SONOMA COUNTY			
9- 15	Santa Rosa NAAS	United States Navy	6
9- 16	Cotati NOLF	United States Navy	3
9- 45	Santa Rosa-Sonoma County	County of Sonoma	4
9- 95	Healdsburg-Alexander Valley	Commercial-Private	1
9- 96	Healdsburg-Norton Sky Ranch	Commercial-Private	1
9- 97	Petaluma-Justman	Commercial-Private	S-1
9- 98	Petaluma-Oakview	Commercial-Private	1
9- 99	Petaluma	Commercial-Private	S-1
9-100	Santa Rosa Airpark	Commercial-Private	1
9-101	Sonoma-Valley of Moon	Commercial-Private	1
MARIN COUNTY			
9- 20	San Rafael-Hamilton AAB	United States Army	6
9-105	San Rafael-Marín Co. Inc.	Commercial-Private	S-1
9-106	San Rafael-San Francisco Bay Airport	Commercial-Private	S-1

A thorough appraisal and evaluation of existing airports is found in Part IV of the State treatment. Repeating the conclusions there reached, with special application to Area 9, it must be stated baldly at the start that the Bay Area ranks fourteenth or last in

the State in airport adequacy, based on weighted effective airports per capita, and area coverage. The subjoined listing of pertinent data makes it apparent at a glance why Area 9 is one of the two Aviation Areas in the State most deficient in adequate airport facilities:

SUMMARY OF AERONAUTICAL APPRAISAL—AREA 9

Source: Table No.		State Total	Area 9	Percent of State Total	San Francisco, San Mateo, Santa Clara Counties	Percent of State Total
63	Population 1946	9,335,000	2,515,150	26.94	1,190,000	12.75
54	Civil Airports	409	46	11.25	16	3.91
50	Public	202	10	4.95	4	1.98
52	Commercial	207	36	17.39	12	5.80
54	Airports per 100M Population	4.381	1.829	41.75	1.345	30.70
55	Civil Airports Weighted	2,043	195	9.54	67	3.28
55	Public	1,316	84	6.38	27	2.05
55	Commercial	727	111	15.27	40	5.50
55	Weighted Units per 100M Population	21.9	7.8	35.61	5.6	25.57
60	Registered Aircraft (10/15/46)	7,200	884	12.28	5.05	7.01
60	Aircraft per 10M Population	7.71	3.51	45.53	4.24	54.99
	Aircraft per Airport 1946	17.60	19.22	109.20	31.56	179.31
	Aircraft per Weighted Unit	3.52	4.53	128.69	7.54	214.20
73	Projected Aircraft—1950	19,100	3,826	20.03	2,141	11.20
	†Weighted Units of Airport Indicated		191		107	
	Percent Change Indicated over 1946		—2.0		59.7	
73	Projected Aircraft—1955	44,400	8,640	19.46	4,831	10.88
	†Weighted Units of Airport Indicated		432		242	
	Percent Increase Indicated over 1950		126.2		126.2	
	Percent Increase Indicated over 1946		121.5		261.2	

† At average of 20 aircraft per unit of weight of airport.

Although the Area in 1946 had 27 percent of the State's population, it had only 11 percent of the total civil airports and only 42 percent as many airports per capita as the State at large. When the airports are weighted for effectiveness, as described in the State discussion, Area 9's position becomes still worse. It has only 9.5 percent of the State's weighted airports and 36 percent of the State's weighted per capita. The Area presently has only 12 percent of the private aircraft in the State in place of the 27 percent which its population would appear to warrant. That this lag is occasioned mainly by lack of available airport facilities is demonstrated by the fact that the Area's aircraft per weighted unit is 129 percent of the State average. In other words, the Area's facilities are already taxed 29 percent more than the average throughout the State. When the projected total of private airplanes in the Area for 1950 is converted to weighted units of airport required, Area 9 shows a decrease of two percent. This clearly proves that the present facilities are not so much inadequate in capacity as in location. The prospective total of aircraft in 1955 however, will require 121.5 percent more weighted airport units than

exist at present. The tabulation gives similar data for the three peninsula Counties of San Francisco, San Mateo and Santa Clara. The significance of this data is mentioned in the State treatment, and it need only be said here that these three Counties are much worse off in respect to adequacy of airports than the Area as a whole.

Notwithstanding its inadequate facilities, Area 9 is the seat of ever increasing aviation activities. As shown in Table 56, scheduled mainline and feederline companies now make 288 in and out flights daily, more than in any other Aviation Area except the Los Angeles Metropolitan. Most of the major United States companies, as well as several leading companies of other nations, are engaged in scheduled service to and from the Bay Area. At present scheduled flights at the San Francisco International Airport amount to 170 daily, and at the Oakland Municipal Airport they total 94. The following summary of operations at these two airports demonstrates the volume and growth of commercial aviation activity at these points within the last two years: (Compare with Table 67)

Airport	In and Out	Commercial Passengers Off and On	Air Express Pounds On	Scheduled Aircraft Movements
San Francisco—1945	521,568	442,968	1,312,496	34,019
1946	954,710	834,360	2,290,881	53,035
Oakland —1945	116,568	49,087	280,413	87,148
1946	170,875	90,804	409,725	130,337
Totals —1945	638,136	492,055	1,592,909	121,167
1946	1,125,585	925,164	2,700,606	183,372
1946 Increase	76%	88%	70%	51%

Four scheduled companies—United Air Lines, Trans World Airlines, Southwest Airways and Western Air Lines—carry freight and passengers between the Bay Area and the rest of the State. United Air Lines provides direct service with the Pacific Northwest, Midwest and East, while Trans World Airlines and Western Air Lines offer air transportation to the Midwest, Pacific Southwest and East by way of Los Angeles. Southwest Airways provides feederline service for San Jose, Santa Rosa and Vallejo on coastal and valley flights, thus furnishing these cities with national and international flight connections.

The volume of commercial non-scheduled and shorter flights is constantly growing and communities must take these operations into consideration when planning their facilities. No data is available on the amount of this non-scheduled transportation of passengers and freight, but it is known that some of the largest companies of this type in the United States operate in the Bay Area. Numerous contracts have been entered into by local merchants for regular air shipments of goods into and from the Area. One of these non-scheduled carriers, Pacific Airlines, operates regularly between Los Angeles, San Francisco and Oakland, and transports both passengers and freight.

In recent months the position of the Bay Area as a terminal and transit point for air freight shipments has become increasingly important and this activity promises to grow rapidly into a major factor of airport use in this Area. Shipments range from flowers and clothing to fish and agricultural perishables, while inbound receipts from the East include clothing, manufactured specialties and cosmetics. The increasing utilization of aircraft, resulting in lower freight rates, will soon create an air freight transportation pattern very similar to previous surface distribution systems. The same factor, its geo-economic position, which in

the past made Area 9 the marketing and surface transportation center for a large part of the State, should, if no unnatural conditions are interposed, result in the Bay Area becoming in the future a central assembling and distributing point for air shipments to and from much of northern California. Air freighters will always go wherever facilities are adequate to pick up full airplane loads; partial loads will have to be assembled for some time at central points which have adequate accommodations.

Airport facilities in Area 9 are probably more inadequate for private flying than for any other form of aviation activity. The wealth and population of the Bay Area should result in a large volume of private aircraft owners. Actually, Table 60 indicates that at the end of 1946 there were 884 owners in the Area, or only 3.51 per 10,000 people. The Bay Area was thus thirteenth, or next to last, among the Aviation Areas of the State in per capita private airplane owners.

The international aspects of aviation in California are treated at length in the State discussion. It need only be mentioned here that full consideration has been given these international possibilities in the development of the major metropolitan airports. As shown in Table 87 exports by air from San Francisco in 1946 amounted to 237,380 pounds, valued at \$1,345,245, while imports totaled 10,127 pounds, valued at \$773,181. At present, United Air Lines, Pan American World Airways, the China National Aviation Corporation, and the Australian National Airways are all engaged in scheduled overseas service from the Bay Area. In addition, several domestic and foreign registered lines are operating on a contract carrier basis, and at least one other foreign flag company plans to initiate service from San Francisco on receipt of equipment. When postwar economic conditions become stabilized, foreign shipments may grow phenomenally.

ESTIMATES OF SCHEDULED TRAFFIC

The increase in commercial passenger service in the Bay Area will not only be representative of a growth in local passenger generation, but will likewise reflect the augmented use of air transportation in other parts of the world because of the national and international scope of operations at the San Francisco and Oakland terminal airports.

Correlating the 1946 on and off passengers and available flight schedules to the projected Area passenger on and off potentials of 1,172,891 for 1950 and 1,660,983 for 1955, it is estimated that Area 9 will require 366 daily passenger schedules by 1950 and 518 daily by 1955. Of these totals, San Francisco and Oakland will require 336 daily schedules in 1950 and 476 in 1955 to meet local passenger requirements. In addi-

tion to local passengers at these two points, it is estimated that the feederline and connecting flight traffic will amount to approximately 400,000 passengers in 1950 and 600,000 in 1955. This will result in a combined terminal load of approximately one and one-half million passengers for Area 9 in 1950 and two and one-quarter million passengers in 1955.

The agricultural production of the nine Bay Area counties offers an important air freight potential, and the following analysis of 1945 surface shipments provides estimates of future air transportation tonnage.

Vegetables and fruit will probably make up only a small proportion of the total volume of air shipments from Area 9. Flowers have already been transported to the East by airplane in quantity. The Bay Area is

CALIFORNIA AIRPORTS

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Alameda	Asparagus	1	12	15	1.8	28	3.4
	Beans (Snap and Lima)	41	410	10	41.0	50	205.0
	Cauliflower	1,103	13,236	0		6	794.2
	Celery	70	840	0		7	58.8
	Lettuce and Romaine	58	696	6	41.8	18	125.3
	Mixed Deciduous Fruit	5	70	2	1.4	8	5.6
	Mixed Vegetables	286	3,432	0		6	205.9
	Pears	10	150	0		2	3.0
	Plums and Fresh Prunes	1	15	1	.2	13	2.0
	Tomatoes	356	4,628	23	1,064.4	43	1,990.0
	Totals	1,931	23,489		1,151.0		3,393.0
Contra Costa	Apriots	545	8,175	2	163.5	8	654.0
	Asparagus	124	1,488	15	223.2	28	416.6
	Celery	163	1,956	0		7	136.9
	Grapes	434	7,378	1	73.8	5	368.9
	Honeydew Melons	462	5,082	0		2	101.6
	Mixed Melons	1	11	0		2	.2
	Peaches	225	2,700	7	189.0	23	621.0
	Pears	323	4,845	0		2	96.9
	Peppers	8	96	5	4.8	14	13.4
	Tomatoes	465	6,045	23	1,390.4	43	2,599.4
	Totals	2,750	37,776		2,045.0		5,009.0
Marin	Grapes	1	17	1	.2	5	1.0
	Totals	1	17	1			1.0
Napa	Grapes	30	510	1	5.1	5	25.5
	Totals	30	510		5.0		26.0
San Francisco	Mixed Deciduous Fruit	2	28	2	.6	8	2.2
	Mixed Vegetables	22	264	0		6	15.8
	Totals	24	292		1.0		18.0
San Mateo	Cabbage	50	600	2	12.0	7	42.0
	Totals	50	600		12.0		42.0
Santa Clara	Apriots	4	60	2	1.2	8	4.8
	Beans (Snap and Lima)	2	20	10	2.0	50	10.0
	Broccoli	267	3,204	0		5	160.2
	Cabbage	3	36	2	.7	7	2.5
	Cauliflower	148	1,776	0		6	106.6
	Celery	85	1,020	0		7	71.4
	Cherries	395	5,135	9	462.2	30	1,540.5
	Cucumbers	3	33	2	.7	13	4.3
	Grapes	27	459	1	4.6	5	23.0
	Greens (except Spinach)	23	207	5	10.4	18	37.3
	Lettuce and Romaine	2	24	6	1.4	18	4.3
	Mixed Deciduous Fruit	5	70	2	1.4	8	5.6
	Mixed Vegetables	420	5,040	0		6	302.4
	Pears	993	14,895	0		2	297.9
	Peas, Green	142	1,420	3	42.6	17	241.4
	Peppers	72	864	5	43.2	14	121.0
	Plums and Fresh Prunes	9	135	1	1.4	13	17.6
	Tomatoes	35	455	23	104.7	43	195.7
	Turnips and Rutabagas	1	19	0		14	2.7
	Totals	2,636	34,872	6	677.0		3,149.0
Solano	Apriots	2	30	2	.6	8	2.4
	Mixed Deciduous Fruits	6	84	2	1.7	8	6.7
	Peaches	8	94	7	6.6	23	21.6
	Pears	54	810	0		2	16.2
	Plums and Fresh Prunes	56	840	1	8.4	13	109.2
	Totals	126	1,858		17.0		156.0

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7½†	Tons	Percent @ 5½†	Tons
Sonoma.....	Grapes.....	103	1,751	1	17.5	5	87.6
	Pears.....	5	75	0	-----	2	1.5
	Totals.....	108	1,826	-----	18.0	-----	89.0
	Area Totals.....	7,655	101,240	-----	3,926.0	-----	11,883.0

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945.*
California Crop and Livestock Reporting Service
and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

one of the most important manufacturing districts in the State and an undetermined quantity of local industrial produce—clothing, newspapers, books, chemicals and machine parts, to mention a few—will eventually move by air. Local fishermen are alert to the possibility

of expanding their market by use of this form of transport.

Based upon the preceding study of potential air freight tonnage, the following conversion to air carrier loads and schedules is effected:

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

AREA 9

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total.....	-----	3,926	1,570	10.00	346	2.00
Alameda.....	351	1,151	460	2.62	102	.58
Contra Costa.....	290	2,045	818	5.64	180	1.24
Marin.....	252	-----	-----	-----	-----	-----
Napa.....	259	5	2	.02	-----	-----
San Francisco.....	356	1	-----	-----	-----	-----
San Mateo.....	319	12	5	.03	1	.01
Santa Clara.....	299	677	271	1.81	60	.40
Solano.....	239	17	7	.06	1	.01
Sonoma.....	207	18	7	.07	2	.02
1955 Total.....	-----	11,883	4,753	31.00	1,047	7.00
Alameda.....	351	3,393	1,357	7.73	299	1.70
Contra Costa.....	290	5,009	2,004	13.82	441	3.04
Marin.....	252	1	-----	-----	-----	-----
Napa.....	259	26	10	.08	2	.02
San Francisco.....	356	18	7	.04	2	.01
San Mateo.....	319	42	17	.11	4	.03
Santa Clara.....	299	3,149	1,260	8.43	277	1.85
Solano.....	239	156	62	.52	14	.12
Sonoma.....	207	89	36	.35	8	.08

Source: Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

Converting these schedule estimates into averages between daily loads of DC-3 and DC-4 types of aircraft, it is estimated that the Area agricultural production will require the service of approximately 6 in and out schedules per day in 1950 and 19 in and out schedules per day in 1955.

Additionally it can be expected that other air freight shipments will use the Bay Area as a major ter-

minal point, and that cargo from other sections of the State will be brought in by truck and air freight feeder planes. Basing an estimate of this type of traffic upon the shipping potential of the contiguous areas, these daily in and out schedules could run as high as 63 in 1950 and 200 in 1955. Then, too, consideration must be given to the products that will be brought to the Bay Area by air carrier for export shipment and a corre-

sponding potential in air imports that will be flown from this Area to other points on the North American continent, thus adding further to the daily air freight schedules.

To accommodate properly the sum total of projected commercial plane schedules, Area 9 will require at least two, and perhaps more, major terminal airports equipped with extensive passenger and warehouse facilities. There must also be a unified system of complementary sub-terminal aviation facilities for the Bay Area, to be used during inclement weather or when excessive daily schedules temporarily preclude the

utilization of the terminal airports. These complementary stations should include such locations as San Jose (Santa Clara County), Martinez (Contra Costa County), Napa (Napa County), and Santa Rosa (Sonoma County). To conduct these comprehensive operations in an orderly manner it will undoubtedly be necessary to establish a master operations organization, with representation from the operating air carriers, terminal and sub-terminal airports, to determine control policy and an equitable distribution of revenue producing commercial aviation activity.

PRIVATE FLYING ESTIMATES

The estimates of private plane ownership determined by factors of current ownership and economic buying potential produce the following county distribution:

County	Index	Private Plane Ownership	
		1950	1955
Alameda	69	1,020	2,304
Contra Costa	51	260	591
Marin	45	71	155
Napa	48	42	93
San Francisco	81	1,308	2,904
San Mateo	102	390	924
Santa Clara	95	443	1,003
Solano	71	174	395
Sonoma	69	118	271
Total		3,826	8,640

The further ownership distribution of these private planes within these counties is effected by the simple economic formula of population and average unit rental set forth in the Non-Scheduled Aviation Projection, Part V.

ALAMEDA COUNTY

Township	Pct.	1950	1955
Alameda	12.75	130	294
Brooklyn	24.86	254	573
Eden	7.63	78	176
Murray	0.64	7	15
Oakland	52.10	531	1,200
Pleasanton	0.39	4	9
Washington	1.63	16	37

CONTRA COSTA COUNTY

Township	Pct.	1950	1955
1	11.09	29	66
2	0.24	1	1
3	9.75	25	58
4	2.19	6	13
5	6.50	17	38
6	5.37	14	32
7	7.99	21	47
8	3.42	9	20
9	1.88	5	11
10	1.54	4	9
11	1.90	5	11
12	17.13	44	101
13	0.32	1	2
14	0.79	2	5
15	27.79	72	164
16	1.31	3	8
17	0.79	2	5

MARIN COUNTY

Township	Pct.	1950	1955
Novato	5.68	4	9
San Rafael	58.42	42	90
Sausalito	34.15	24	54
Tomales	1.75	1	2

NAPA COUNTY

Township	Pct.	1950	1955
Calistoga	5.81	3	5
Napa	81.58	34	76
St. Helena	12.61	5	12

SAN FRANCISCO COUNTY

Township	Pct.	1950	1955
San Francisco	100.00	1,308	2,904

SAN MATEO COUNTY

Township	Pct.	1950	1955
1	19.57	76	181
2	35.08	137	324
3	27.06	106	250
4	2.02	8	19
5	16.27	63	150

SANTA CLARA COUNTY

Township	Pct.	1950	1955
Burnett	1.45	6	14
Campbell	2.30	10	23
Fremont	8.38	37	84
Gilroy	3.75	17	38
Palo Alto	16.97	75	170
Redwood	4.56	20	46
San Jose	47.99	213	481
Santa Clara	8.84	39	89
Saratoga	1.70	8	17
Sunnyvale	4.06	18	41

SOLANO COUNTY

Township	Pct.	1950	1955
Benicia	5.68	10	22
Denverton	0.41	1	2
Elmira	0.58	1	2
Green Valley	0.56	1	2
Maine Prairie	0.30	-	1
Montezuma	0.38	1	2
Rio Vista	5.66	10	22
Silveyville	5.00	9	20
Suisun	6.48	11	26
Tremont	0.21	-	1
Vacaville	3.51	6	14
Vallejo	71.23	124	281

SONOMA COUNTY

<i>Township</i>	<i>Pct.</i>	<i>1950</i>	<i>1955</i>
Analy -----	9.77	12	26
Cloverdale -----	3.28	4	9
Healdsburg -----	8.95	10	24
Petaluma -----	24.50	29	66
Redwood -----	3.32	4	9
Santa Rosa -----	39.67	47	108
Sonoma -----	10.51	12	29

RECOMMENDED AIRPORT DEVELOPMENT

The Bay Area presents special difficulties to devising an adequate overall plan of airports. The population is densely concentrated on the very limited coastal land immediately adjacent to San Francisco Bay and then thins out towards the boundaries of the Area, with occasional urban centers in each county. Airport sites in the most densely populated sections are non-existent and have to be literally created by filling in tideland or shallow portions of the Bay. Facilities established by such expensive methods do not lend themselves to ready expansion. Outlying airports must be planned with the possibility of having to handle part of the private flying needs of the densely settled central region. The airport planner has to keep in mind at all times the presence of several large Army and Naval Air Bases. The exigencies of public defense make it imperative that no facility be planned which would interfere in the slightest with the operation of these airports. Because of the hublike pattern of airways radiating from the metropolitan centers, much of the Area is blanketed by airways. The location of larger facilities is often determined by this factor alone.

Several conclusions may be drawn from the 25 airport recommendations made below. Two counties, Marin and Santa Clara, definitely need medium airports to handle feederline and freight service. One other county, Solano, lacks such an airport but can use a facility which is conveniently located, but in another county. San Francisco's large airport is by necessity located in another county. If these recommendations are followed, all the counties, with these two exceptions will have one facility—of at least Class 3 standard—located within the County. Ten of the proposals made were based mainly on the local private aircraft potential likely to develop. Thirteen other suggestions were influenced by a combination of reasons—to give the County, Area, or part of the State better coverage, to provide for anticipated private airplane requirements of visitors and tourists in addition to those of local private aircraft, or to satisfy obvious needs of the Forestry Services. In each case the reasons leading to the recommendations are clearly indicated.

ALAMEDA COUNTY

Completion of pending improvements at the Hayward and Oakland Municipal Airports and maximum utilization should satisfy the requirements of scheduled

Much use has been made of these townships' private aircraft potentials in arriving at the specific airport recommendations made below. It has often been necessary, however, to combine the potentials of contiguous townships to determine the potential of the area likely to be served by a proposed airport facility.

operations in Alameda County for the period of this study. Certain additional facilities, however, will be necessary for non-scheduled flying.

Berkeley

Berkeley is a university town with a population of over 100,000. It lies on a narrow coastal plain with heavily populated districts neighboring on the north and south. It is estimated that the local inhabitants alone will have a minimum of 159 aircraft in 1950 and 360 in 1955. To these numbers should be added the airplane potentials of Emeryville, El Cerrito, and communities as far as Richmond—all within easy access of the Berkeley service area. A major university has many activities encouraging visiting airplanes and an attractive airport at Berkeley would doubtless draw patrons from nearby metropolitan centers. The possibility of filling in the tidelands at the terminal of the old ferry line has been discussed for over ten years and tentative plans made. It is recommended that these plans be carried into effect and a Class 2 airport be constructed at this site by 1950, with adequate provision for enlargement to Class 3 by 1955, and even further ultimate expansion.

Centerville Area

This area has a population of over 20,000 and a theoretical airplane potential ownership of 16 in 1950 and 37 in 1955. Inasmuch as the existing Class S-2 airport near Centerville already serves more aircraft than the 1950 potential, it is obvious that future owners will be much more numerous than anticipated. It is believed that either the existing private airport or some site equally convenient to both Centerville and Niles should be developed to full Class 2 standards by 1950 to handle both locally owned aircraft and serve part of the overflow from crowded metropolitan sections.

CONTRA COSTA COUNTY

When the present plans for improvements are completed, Buchanan Field at Concord should prove adequate to serve Contra Costa's requirements for feederline service, charter operations and air freight until 1955. This airport could also be used as an alternate for San Francisco and Oakland facilities. Non-scheduled requirements throughout the county, however, will make the following additional facilities necessary:

Antioch

Antioch, a city of some 7,000 inhabitants, is located on the San Joaquin Delta, about five miles from Pittsburg. Two private sub-standard Class 1 facilities serve this city at present. The County Master Plan recommends that one of these airports, Sky Vale, be improved to Class 2 standards by 1955, and that a Class 1 facility be built at Pittsburg by 1950. The total population of the Pittsburg-Antioch area is estimated at 30,000, with a possible aircraft ownership of 23 in 1950 and 52 in 1955. A Class 1 facility at Antioch should suffice to meet the non-scheduled requirements of the two cities in 1950. If local developments warrant, this airport should be improved to Class 2 standards by 1955.

Brentwood-Byron

Brentwood, with a population of 2,569 at the last census, and Byron, with a population of 1,000, lie in the middle of a fertile irrigated agricultural district in the eastern part of the County. It is estimated that the total population of the three contiguous townships in this area amounts to 19,000 and has a private airplane potential of 9 by 1950 and 21 by 1955. The County Master Plan suggests a Class 1 facility at Brentwood by 1950 and a Class 2 by 1955. For reasons cited above, the present study concludes that a site approximately midway between Brentwood and Byron could best serve the private airplane potential likely to develop in the entire area. Such a site would be within three miles of either town and 10 air miles from the airport at Antioch recommended for development. If a Class 1 facility is built here by 1950, and this enlarged to Class 2 by 1955, the needs of the anticipated aircraft owner potential for the area would be fully met.

Richmond

Richmond is the center of an important manufacturing and industrial belt with a total population of about 113,000. It is predicted that this area will have 125 private airplanes in 1950 and 285 in 1955. The city lies approximately 16 air miles from Buchanan Field and about five miles northwest of the proposed airport at Berkeley. The County has proposed that a Class 2 facility be developed at Richmond by 1950 and that this be improved to Class 3 by 1955. Because of the airplane potential indicated and the fact that facilities at the proposed Berkeley airport would soon be taxed by local aircraft and possible overflow from the south, it is recommended that Richmond have a Class 2 airport by 1950. Especially if a suitable site could be found north of Richmond, this facility would be readily accessible to aircraft owners in Pinole, Hercules, Rodeo and Crockett. This area manufactures certain miscellaneous industrial produce that may in time prove profitable to ship by air, but, during the period under study, such freight could be carried by truck to Buchanan Field for enplaning.

San Ramon

San Ramon is a small town situated in an extensively cultivated agricultural area. The estimated population of the township is 5,600, and it is believed that increased population will result in a minimum aircraft ownership of 13 aircraft by 1955. The County Plan believes it advisable to raise the existing private S-2 airport to full standard Class 2 by 1955. This facility is approximately 17 air miles from Buchanan Field and the proposed Brentwood-Byron site, and about 12 miles from Hayward and somewhat less from Livermore. The present study concurs that this facility be improved to full Class 2 standards by 1955. San Ramon Airport lies in the center of Red 60 Civil Airway from Oakland to Stockton and would prove useful for emergency landings. An airport here would give Contra Costa and Alameda Counties better airport coverage. Finally, the improvement of this facility would more than meet the requirements of potential aircraft owners.

MARIN COUNTY

Although Marin County covers 333,440 acres, and was estimated in 1945 to have 77,150 inhabitants with a total individual income of \$85,040,000, the County remains to the present with only two substandard Class 1 private landing fields to serve its aeronautical requirements. The large Army Air Base at San Rafael is not available for civilian flying. The following recommendations are presented to remedy this situation.

Bolinas

Bolinas is a small fishing and resort town, picturesquely situated on Bolinas Bay, a short distance north of Stinson and Muir Beaches, which are crowded by visitors during the warmer months. It is estimated that this district may have 9 aircraft owners by 1950. Marin County has considered locating a Class 1 airport here on a high, flat mesa overlooking the Pacific Ocean. The suggested site is 11 air miles from the proposed Green Brae Airport, 15 miles from Hamilton Field, 18 miles from the suggested facility at Point Reyes, and 17½ miles from the center of San Francisco. It is believed that the County's suggestion should be followed, and a Class 1 airport built on the site selected by 1950. A facility at this point would satisfy the needs of local airplane owners, permit private aircraft flyers from the entire State to visit the local beaches over a weekend, and serve as an emergency landing field.

Green Brae (Corte Madera)

The Marin County Planning Commission has proposed a site for a Class 3 airport development at Green Brae, on the Bay shoreline close to Corte Madera and approximately three miles from San Rafael, the County Seat. It is estimated that 75 percent of the County's population lives within a five mile radius of this location which lies on Blue 7 Civil Airway, 10 miles south of the Army Air Base at Hamilton Field. It is believed

that the local residents within the service area will own 57 aircraft by 1950 and 131 by 1955. County plans envision a Class 3 establishment which would be a recreation center with a yacht harbor and seaplane facilities. The plans provide for ultimate development to Class 4 standards. The suggested site is within 15 minutes' driving time from San Francisco and the accessibility of the Green Brae Airport to the residents of that city, especially those in the northern sector, would help relieve the congestion of airports to the south, and yet not compete unduly with the proposed facility on Treasure Island. The natural recreational opportunities in Marin County are well known, and the facilities being planned at the new airport will be so many additional attractions. Mount Tamalpais was visited by 46,475 persons in 1946 (Table 18) and Muir Woods by 264,287 (Table 16). A conveniently located airport will doubtless increase these numbers considerably. Because of its location on feederline service routes north of San Francisco, there is every possibility that Green Brae will be made a station stop by 1955. Recommendations for a Class 2 facility at Green Brae are included in the 1947 National Airport Plan and Program, and the United States Forestry Service has requested a Class 2 airport at this point. The needs of private aircraft owners—local, neighboring and visiting—and forest patrol services—clearly require a Class 2 facility at this site by 1950. Increasing non-scheduled demands and possible feederline service indicate the advisability of raising the standards to Class 3 development by 1955.

Point Reyes

Marin County has expressed a desire for a Class 1 facility at Point Reyes. The best site appears to be at the headwaters of Drake's Estero, less than one mile from the beaches and five miles from Tomales. This location would be 13 air miles from Bolinas, 36 air miles from San Francisco, and about 28 air miles from the proposed site at Jenner. A Class 1 airport at Point Reyes would make the local fishing, boating and surf bathing available to many more visitors, serve as an emergency landing field, and form an important link between Bolinas and Jenner in the proposed coastal chain of airports. It is therefore recommended that such a facility be constructed here by 1950.

NAPA COUNTY

At present Napa County is served by the Class 4 County Airport south of Napa and two private Class 1 facilities open to the public. It is believed that if the pending improvements are completed at the Napa County Airport, this facility will be able to handle all feeder line service and cargo operations likely to develop in the County during the period of study. The main requirements of the County are several Class 1 facilities to accommodate private flyers and give better overall County airport coverage.

Monticello

Monticello is a small community lying in the agricultural Berryessa Valley, about 23 air miles from Napa County Airport and 15 miles from St. Helena. The County Master Airport Plan proposes that a Class 1 airport be built here if reclamation projects permit and the State Forestry Service makes a like request. Although the local aircraft ownership potential in itself would not justify an airport, the present study believes that the district should have a Class 1 facility by 1950 to satisfy the forestry needs and provide an emergency landing field at this point just off Amber 1 Civil Airway.

Pope Valley

Pope Valley is a small village in the north central part of the County, approximately 10 air miles from St. Helena. The County has indicated several good sites in the vicinity for an airport. Several mineral springs and a college are located close by. It is suggested that a Class 1 facility be developed here by 1955 to serve the private flying needs of residents and visitors and provide a better coverage for this particular portion of the State in the way of emergency fields.

St. Helena

St. Helena and Calistoga are situated in the Upper Napa Valley, about nine air miles apart. The former city has a population of about 2,000 and serves a trade area of 7,000. It lies in the midst of a rich wine producing area with a large sanitarium close by. Calistoga has slightly over 1,000 residents and is the center of a trading area of about 2,700 persons. It is noted for its mineral springs of interest to invalids, and the Petrified Forest which attracts many tourists. It is estimated that these cities together will have a total of 8 aircraft owners by 1950 and 17 by 1955. The community is served at present by a private Class 1 airport near Calistoga. The County Master Airport Plan suggests a Class 1 facility for the district at several possible sites either midway between the two cities or close to St. Helena. Inasmuch as the Napa County Airport is situated well south of Napa and about 20 air miles from St. Helena, it is believed that a location somewhat nearer St. Helena than Calistoga would best serve the needs of resident and visiting airplane owners. A Class 1 airport should be completed at this point by 1950.

SAN FRANCISCO COUNTY

Treasure Island

The San Francisco Municipal Airport appears committed to a policy of continued development as a major terminal for national and international transport service. Table 13 shows that the maximum operations during peak hours in the first half of 1946 reached 33, although it is generally considered that 20 operations

per hour is the maximum allowable for safety with instrument flying. Even when the proposed improvements, including a dual runway system for landings and take-offs, are completed, the airport will be adequate only up to the time when operations do not exceed approximately 100 per hour. There are present indications that this airport will of necessity be reserved for the needs of scheduled transport service by the end of the period under study, if not before. San Francisco has an estimated private aircraft potential of 1,308 by 1950 and 2,904 by 1955. The prospect is that this entire non-scheduled potential must look elsewhere for airport facilities. The possibility of handling some of this potential has been given consideration in the airport recommendations made for Marin, the East Bay and Peninsula Counties. All of these counties, however, and particularly those of the East Bay, may find themselves taxed within a relatively short time to accommodate their resident aircraft owners. It is therefore unequivocally recommended that Treasure Island be returned to its original purpose—to serve as an airport of ready access to San Francisco. Treasure Island is preeminently suited for development as a Class 3 facility to handle San Francisco's private flying requirements.

SAN MATEO COUNTY

The necessity of integrating local airport planning with facility requirements of the entire Bay Area is especially compelling in the case of San Mateo County. Cities in two other counties, San Francisco and Palo Alto, have been forced to locate their airports in San Mateo County. The series of close-lying, thickly populated cities and towns stretching down the Peninsula from San Francisco through Palo Alto are virtually one economic unit, and thousands who live in these Peninsula communities commute daily to work. The total population of all this urban and suburban district is about 190,000 with an airplane potential of 457 in 1950 and 1,075 in 1955. These potentials make no allowance for San Francisco's large future aircraft ownership, although even if Treasure Island is developed as recommended, a certain amount of overflow from San Francisco would have to be accommodated on these Peninsula airports.

The San Francisco Municipal Airport can be developed with a view to handling San Mateo's scheduled operations in addition to those of San Francisco. The approach channel to this airport, however, has a restrictive bearing on future airport construction in San Mateo County and the most logical solution to adequate non-scheduled accommodation would appear to be the enlargement and improving of existing facilities, especially those south of Bay Meadows. Various reasons militate against alternative solutions. Constructing facilities in the hills between Skyline Boulevard and El Camino Real would prove very costly; development in the Atherton district would be prohibited by high

property values; sites on the ocean side of the County would be too distant from population centers.

Belmont

It is recommended that the present private S-2 facility at Belmont be raised to Class 3 standards by 1950. This airport lies about nine air miles southeast of the San Francisco Municipal Airport and just off Blue 7 Civil Airway. An airport here would be readily accessible to private flyers in Burlingame and San Mateo and in the many large estates in the neighborhood.

Palo Alto

The present Class 1 Palo Alto Municipal Airport just north of the San Mateo County line, has already proved inadequate. This airport lies on Blue 7 Civil Airway, eight air miles southeast of the proposed development at San Carlos, and 17 miles southeast of the San Francisco Municipal Airport. Palo Alto is a rapidly growing college town with more than 18,000 residents. The theoretical private airplane ownership is 75 for 1950 and 170 for 1955. The fact that 125 aircraft are based on the Municipal Airport already shows that these totals will be greatly exceeded. At the very least, future developments of this facility should make provision for serving Redwood City, only four miles distant. The 1947 National Airport Plan lists improvements which would raise this facility to Class 3. The present study concurs that there is obvious need for a Class 3 development here by 1950.

San Carlos

There are two existing facilities in the neighborhood of San Carlos, one of them too close to the Belmont Airport for development. The other private air field, Patton airport, lies just off the Civil Airway about three air miles from the Belmont site and eight air miles northwest of Palo Alto Municipal Airport. It is advised that this airport be raised to Class 3 standards by 1950 to serve part of the Peninsula private aircraft owners. The site is within short driving distance of several high income residential districts and should prove a valuable link in the chain of necessary peninsula airports.

SANTA CLARA COUNTY

Airport planning in Santa Clara County does not have to contend with the extreme population concentrations found in certain other counties in the Bay Area, but possible airport development is hampered to a certain extent by commercial airways blanketing a large part of the County. In this instance, however, the altitude of flight provides a mitigating factor.

Los Gatos

Los Gatos, with a population of 3,597, lies near the entrance of one of the main routes through the Santa Cruz Range. It is situated in a pleasant countryside,

surrounded by orchards and country estates, not far from several private schools, a public art museum of considerable interest, and the popular Congress Springs. There are numerous visitors, especially on weekends and holidays. The population of the township in the service area is about 16,000 with a private aircraft potential of 28 by 1950 and 63 by 1955. This community is served at present by a Private S-1 facility which is located on the edge of a civil airway, approximately 13 air miles south of San Jose Municipal Airport and 10 air miles northwest of the private landing strip at Morgan Hill. It is recommended that a Class 2 airport be constructed here by 1950 to give the County better overall airport coverage and provide an emergency landing field on this side of the Santa Cruz Range for aircraft flying to Santa Cruz. Adequate facilities for local and visiting private flyers would also permit developments at San Jose to be oriented towards cargo and scheduled operations.

San Antonio Creek

The State Forestry Service has requested a Class 1 facility in the neighborhood of San Antonio Creek in the extreme northeastern corner of the County. It is believed that this request should be complied with and the airport completed by 1950. This site is slightly over 20 air miles from the San Jose Municipal Airport and about 20 air miles from the airport at Vernalis. Besides meeting the needs of forest patrol, a facility at this point would be valuable for emergency landing purposes in this remote stretch of the Diablo Range between Santa Clara and San Joaquin Valleys.

San Jose

San Jose is the County Seat of Santa Clara County, a city with a population of 80,734 and surrounded by a metropolitan trading area of nearly 150,000. It is predicted that the three adjacent townships in the area will have 262 private aircraft owners in 1950 and 593 in 1955. Santa Clara County is renowned for its agricultural products, especially fruit, and it is anticipated that 677 tons of perishables will move by air freight in 1950 and 3,149 tons in 1955. This tonnage includes only agricultural perishables, although local industries are producing a constantly increasing variety of other foods, part of which may prove adaptable to air transport. Two privately owned S-2 airports are located in the vicinity and San Jose has acquired the site for a municipal facility and prepared plans to improve this as quickly as possible. This site is two miles northwest of the city on the main air route flown by three major airlines, at the junction of Amber 1, Blue 7 and Blue 47 Airways. An airport here would be 17 miles from Palo Alto and about 28 air miles from Watsonville. Not waiting for the completion of municipal facilities, one airline has already instituted feederline service at San Jose with four in and out flights daily. Other companies

are desirous of making San Jose a stop. It has been proposed in the National Airport Plan and Program for 1947 that San Jose Municipal Airport be developed to Class 3. The present study thoroughly endorses this recommendation. Existing and future feederline service, cargo potentials, and non-scheduled flying requirements all make an airport of this size imperatively necessary. Provision should be made in the plans for enlarging the airport to Class 5 by 1955. A facility of this size would prove invaluable as an alternate for San Francisco and Oakland during inclement weather. If this proposal is adopted, San Jose will be the site of the major County Airport for scheduled and cargo operations.

SOLANO COUNTY

Solano County's Master Airport Plan claims that the County's needs are fairly well served by existing airports, and that no changes should be proposed which would interfere in any way with operations of the large Army Air Base at Fairfield. Scheduled service and the small freight potential predicted can be handled by Napa County Airport which was purposely located only a few miles from Vallejo. Establishment of any large facility at the latter city, although indicated by private aircraft potentials, is precluded by its closeness to the Napa County Airport. The County has a sufficiently good coverage of small private airports to serve the estimated private flying requirements for the period of this study.

Fairfield-Suisun

The Solano Master Airport Plan does recommend that a full Class 2 facility be instituted at Fairfield-Suisun. The community is served at present by a private S-2 airport located one mile east of town on the Red 46 Civil Airway. Inasmuch as Fairfield is the County Seat and the County has no full Class 2 airport, the County's suggestion should be followed and a Class 2 facility be provided at Fairfield-Suisun by 1950.

SONOMA COUNTY

Sonoma County's aeronautical requirements are presently served by the Class 4 Sonoma County Airport at Santa Rosa and by seven Class 1 or sub-standard Class 1 private facilities. Although the County's local private flying potential is not large, there is a poorer coverage of Class 1 airports than apparent from the number, as two are in close proximity to two others. When the planned improvements at the Sonoma County Airport are completed, this facility should suffice to meet the immediate scheduled and freight requirements of the County, and to serve as an alternate for San Francisco and Oakland in case of need. The following suggestions are made mainly to improve access to the recreational attractions of the County, protect its forests, and give it better planned coverage of airports.

The exact sites of improvements were selected as best coordinating with an overall plan including neighboring counties.

Cotati

The United States Navy has an excellent Class 3 airport at Cotati, eight miles southeast of Santa Rosa which may soon be available for public use. In such an event Cotati should bend every effort toward acquiring a facility which would provide local feederline operation base and be sufficiently large for cargo aircraft. Although, as already mentioned, the perishable fruit air freight potential in the area is not large, and could be handled without difficulty at Santa Rosa, air shipments of baby chicks are proving exceedingly profitable and Petaluma, one of the State's most important poultry raising centers, is only eight miles distant. It is estimated that the township will have 29 private airplane owners by 1950 and 66 by 1955. An airport at Cotati would be convenient for these and also for vacationists flying to the Russian River resorts, since Cotati is one of the main points of entry to the Russian River area.

Gualala

The State Division of Forestry would like to see an airport built in this extreme northwestern corner of the County. It is believed that a Class 1 facility at this point by 1950 is desirable, not only to serve forest patrol needs, but to provide a link in coastal airports between the suggested sites at Point Arena and Jenner. Private aircraft flyers would find a landing field here convenient in case of emergency or if they wanted to visit the Kashia Indian Reservation or Kruse Rhododendron State Park. The latter attracted 15,000 persons in 1946, although a special side trip had to be made by automobile (Table 18).

Jenner

It is recommended that a Class 1 facility be developed near Jenner by 1950. An airport here would be

in the coastal chain of available facilities and although the Forestry Service has not expressed an interest in this precise site, it should find a facility here useful. The main reason for this suggestion is to provide an airport directly accessible to the Russian River recreation area. The Sonoma Coast State Park, stretching from Jenner to Bodega Bay, is famous for its surf fishing and was visited by 61,990 persons in 1946. (Table 18.) The attractions of the numerous river resorts and nearby camps are well known. Armstrong Redwoods, just north of Russian River, had 178,450 visitors in 1946 (Table 18). The probability that even a small percentage of these visitors would prefer to come by private aircraft suggests the desirability of an airport facility near the recreational area.

The Geysers

The State Department of Forestry has asked for an airport at The Geysers in the northeastern corner of the County, about 15 air miles from Healdsburg and 10 air miles from Middletown. The present study concurs that a Class 1 facility should be built at this point by 1950 as such an airport would aid forest fire control, provide better coordinated airport coverage for this part of Sonoma County and the contiguous portion of Lake County, serve emergency needs, and permit tourists traveling in light aircraft to visit the topical attractions.

Wheatfield Fork

The State Department of Forestry has also requested a landing facility near the headwaters of Wheatfield Fork, approximately 18 air miles north of the proposed site at Jenner, 18 air miles southeast of Gualala, and 20 air miles northwest of Healdsburg. If this airport were located near the highway it would be close to both the Kashia Indian Reservation and the Kruse Rhododendron Park, already mentioned. It is recommended that a Class 1 airport be constructed here by 1950.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 9

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Alameda County							
Berkeley.....				2	NS	3	NS
Centerville Area.....	Center Field.....	Private.....	S-2	2	NS		
Contra Costa County							
Antioch.....	Sky Vale.....	Private.....	S-1	1	NS	2	NS
Brentwood-Byron.....				1	NS		
Richmond.....				2	NS		
San Ramon.....		Private.....	S-2			2	NS
Marin County							
Bolinas.....				1	NS,R		
Green Brae (Corte Madera).....				2	NS,R,FS	3	FP
Point Reyes.....				1	NS,R		
Napa County							
Monticello.....				1	NS,FS		
Pope Valley.....						1	NS,R
St. Helena.....				1	NS,R		
San Francisco County							
Treasure Island.....				3	NS		
San Mateo County							
Belmont.....	Belmont.....	Private.....	S-2	3	NS		
Palo Alto.....	Palo Alto Municipal.....	Public.....	1	3	NS,FS		
San Carlos.....	Patton.....	Private.....	1	3	NS		
Santa Clara County							
Los Gatos.....	Ames.....	Private.....	S-1	2	NS,R		
San Antonio Creek.....				1	NS,FS		
San Jose.....	San Jose Municipal.....		S-1	3	NS,FE,FP,C	5	NS,FE,C
Solano County							
Fairfield-Suisun.....	Fairfield-Suisun Airpark.....	Private.....	S-2	2	NS		
Sonoma County							
Cotati.....	NOLF.....	(U.S. Navy)	3	3	NS,FP,C,R		
Gualala.....				1	NS,FS,R		
Jenner.....				1	NS,FS,R		
The Geysers.....				1	R,FS		
Wheatland Fork.....				1	FS		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

APPENDIX 10

AREA 10—SACRAMENTO METROPOLITAN

NATURAL CHARACTERISTICS

Geography and Topography

Bounded by the State of Nevada on the east, the counties of Plumas, Colusa and Butte on the north, Lake, Napa and Solano on the west, and San Joaquin, Calaveras and Alpine on the south, Area 10 can be thought of as a central section of California lying west of the Lake Tahoe Area. It comprises the nine counties of Sierra, Nevada, Placer, El Dorado, Amador, Sacramento, Sutter, Yolo and Yuba, with elevations ranging from sea level to 11,429 feet. The western portion is in the fertile Sacramento Valley, the center section contains the heart of the "Mother Lode," most famous of California's gold mining regions, while further east are the high mountains of the Sierra Nevada.

All the rivers of this Area, with the exception of the Truckee which flows into Nevada, drain the watershed into the Sacramento Valley, the most important rivers being the Bear River, Consumnes, Rubicon, American and Yuba. Cache and Putah Creeks drain western Yolo County, and the Feather River enters the north central portion of Area 10, converging with the Sacramento River in lower Sutter County. The Sacramento River then empties all these waters into Suisun Bay which is the extreme western boundary of this Aviation Area.

Climate

The climate of Area 10 varies with the altitude. The valley sections are hot in the summer and mild in winter with no snow; summer is rainless and most of the spring and autumn months are cloudless. The higher central portions have a moderate climate and the mountains in the eastern part have heavy snows and cold during the winter months. On the valley floor rainfall averages less than 20 inches but farther to the east, in the higher elevations, the rainfall is normally between 40 and 50 inches a year.

The climate has been responsible for the nature of most of the basic industries in Area 10. The long grow-

ing season in the valley, the warm days and cool nights in the foothills, and the heavy precipitation in the forested areas of the Sierra Nevada Mountains have made possible the growing of a large variety of agricultural products in the valley and foothill sections and timber along the Sierra slope. During the summer months the cool mountains on the east have been a haven for residents in the valley area and during the winter months the relatively short distance from the valley floor to the snowline has stimulated the tourist industry throughout the mountainous region of Area 10. The entire mountainous section is a splendid recreational area, the most famous being the Tahoe, Kyburz, and Sugar Bowl sections.

Land Usage

Agricultural usage of the land in Area 10 predominates, although the farm acreages are fairly well divided into land in crops, idle cropland, and farm woodland. An examination of the general usage of land shows the lowland areas devoting a large percentage of the soil to agriculture, while portions to the east of the valley floor are primarily utilizing the natural resources of the land. Lumbering and mining make major contributions to the economy of the foothill and mountainous sections.

The total acreage of the nine counties is over five and three-quarter million acres and this Area is presently being used as shown below (from Table 15) :

Total Area	5,728,640 acres
Land used for crops_	711,855
Idle cropland	722,316
Woodland and other	957,569
Other private land_	1,584,808
Total privately owned.....	3,976,548 or 69.42%
National forests and parks	1,261,977
Other public lands_	490,115
Total public lands.....	1,752,092 or 30.58%

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

Agriculture

Only five counties, Placer, Sacramento, Sutter, Yolo and Yuba are principally agricultural counties, whereas Amador, El Dorado, Nevada and Sierra Counties are largely mountainous and forested areas with livestock, hay, pears and apples as the principal agricultural products. The valley area is one of California's most prolific producers of agricultural crops, the prod-

ucts of which are not only of considerable volume but also of wide variety. The warm and mild climate of the lower regions permits year around production of crops and at every season there is harvesting of some of the varieties of tree and ground crops.

The Sacramento Area, because of its strategic and advantageous geographical location, acts as the hub for transportation into all portions of Area 10. Greater

speed and flexibility in the transportation of local agricultural specialties and perishables, which are adaptable to air freight, will accelerate and expand agricultural development in this portion of the Sacramento

Valley. The following chart lists, according to monetary value, the five leading agricultural products of the agricultural counties in this Aviation Area (from Table 24) :

County	1st	2d	3d	4th	5th
Placer.....	*Plums	Beef	*Pears	Turkeys	Wheat
Sacramento.....	Poultry	Dairy	Asparagus	Sugar Beets	Tomatoes
Sutter.....	*Peaches	Beans	Rice	Prunes	Dairy
Yolo.....	*Beets	Sheep	Apricots	Tomatoes	Dairy
Yuba.....	Beef	Sheep	Peaches	Dairy	Pears

* County ranked first in value of product in 1940.

Source: California State Chamber of Commerce—Research Department, Economic Survey Series, 1941-42, Report No. 23.

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	El Dorado	Placer	Sacramento	Sutter	Yolo	Yuba
Apples.....	14		9	5		
Apricots.....		11	4	8	306	
Asparagus.....			152			
Broccoli.....			7			
Cabbage.....			2			
Cantaloupe.....					95	
Casabas.....				2		
Celery.....			90			
Cherries.....		3				
Grapefruit.....			5			
Grapes.....		205	181		50	
Honeydew Melons.....			14	280	588	
Lettuce and Romaine.....			5			
Mixed Citrus Fruits.....			4			
Mixed Deciduous Fruits.....	30	166	43	21	35	
Mixed Melons.....				92	8	
Mixed Vegetables.....			30			
Onions.....			109			
Oranges and Satsumas.....			6			
Peaches.....		57		81		19
Peaches (Dried).....			3	3	27	9
Pears.....	1,011	1,395	1,697	160	35	243
Peas (Green).....			502		50	
Persian Melons.....				159		
Plums and Fresh Prunes.....		1,104	47	67	21	11
Potatoes (White).....			10			4
Prunes (Dried).....			8	338	19	78
Tomatoes.....			772		57	
Totals.....	1,055	2,941	3,700	1,216	1,291	364
Grand Total.....						10,567

Source: California Carlot Shipments, Fruits and Vegetables, 1945, California Crop and Livestock Reporting Service and Federal-State Market News Service.

The foregoing tabulation indicates the wide variety and volume of agricultural produce shipped from the Area.

Income

Cash farm income in three of the five agricultural counties increased more rapidly in 1940 and 1945 than

it did in the United States or California as a whole; one county, not generally classed as an agricultural county, also experienced a large increase in cash farm income between 1940 and 1945. It should be pointed out that a comparison of dollar values between these two years must consider the national increase in prices but the primary reason for the large increase in the aforementioned counties was food processing in those areas.

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)
(In thousands of dollars)

	1940			1945			Percent change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States	\$8,343,000	-----	100.00	\$20,780,900	-----	100.00	149.08
California	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Amador	1,150	.17	.01	2,188	.12	.01	90.26
El Dorado	1,800	.27	.02	4,724	.26	.02	162.44
Nevada	700	.11	.01	1,412	.08	.01	101.71
Placer	4,600	.68	.06	12,983	.73	.06	182.24
Sacramento	15,700	2.33	.19	35,471	1.99	.17	125.93
Sierra	333	.05	.01	665	.04	-----	99.70
Sutter	12,700	1.89	.15	29,827	1.61	.14	126.98
Yolo	14,000	2.08	.17	32,507	1.82	.16	132.19
Yuba	2,900	.43	.03	7,718	.43	.04	166.14
Total Area 10	\$53,883	8.01	.65	\$126,495	7.08	.61	134.76

Source: California Crop and Livestock Reporting Service.
United States totals from *Statistical Abstract of the United States*, 1946.

Timber Production

More than 12 percent of the State's timber available for lumber production is contained in Area 10, principally the counties of Amador, El Dorado, Nevada, Placer, Sierra and Yuba; the 1945 lumber cut of 105 of

the State's 457 sawmills amounted to over 15 percent of California's lumber production. A tabulation breakdown for each county's potential and actual lumber production in California for 1945 is shown below, (From Table 23), in thousands of board feet:

	Total Volume	Pct. Available	Amount Available	No. Mills Active	Production 1945	Pct. of Calif.
CALIFORNIA	243,431,000	--	182,458,290	457	2,260,792	--
Amador	1,665,000	97	1,615,050	5	48,437	2.14
El Dorado	9,319,000	89	8,293,910	34	144,462	6.39
Nevada	2,651,000	92	2,438,920	17	19,618	.87
Placer	5,065,000	89	4,507,850	22	24,214	1.07
Sacramento	---	--	---	---	---	---
Sierra	4,620,000	70	3,234,000	6	*47,989	2.12
Sutter	---	--	---	---	---	---
Yolo	---	--	---	---	---	---
Yuba	1,908,000	99	1,888,920	21	57,952	2.57
Total Area 10	25,228,000	--	21,978,650	105	342,672	15.16

* Combined with Nevada to avoid disclosing output of individual establishments.

Source: Total volume and amount available from California Forest and Range Experiment Station, Forest Survey Release No. 4, March 1, 1946.

Production, 1945, from United States Department of Agriculture Forest Service, California Forest and Range Experiment Station, *Forest Research Notes*, No. 50, Sept. 12, 1946.

At present there is a serious lack of airports in the forested and higher elevations of the Area and visitors to the forests and parks should be provided with landing facilities which would also serve the needs of the State and Federal forestry services which are summarized below:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

*Area 10 by Counties**Amador County*

1. Class 2 at Sutter Creek—State Division of Forestry. The Division will use the field as constituted at present.

El Dorado County

1. Class 1 at Camino—State Division of Forestry.
2. Class 2 at Placerville.

Nevada County

1. Class 2 at Nevada City—United States Forest Service.
2. Class 1 at Grass Valley—State Division of Forestry. The Division could use the field as constituted at present if brought up to CAA standards.
3. Class 2 at Truckee—United States Forest Service.

Placer County

1. Class 2 at Auburn will be used by both forestry services as presently constituted.
2. Class 2 at Blue Canyon—United States Forest Service. The State Division of Forestry will use the field in its existing condition.
3. Class 1 at Colfax—State Division of Forestry.
4. Class 2 at Forest Hill—United States Forest Service.

Sacramento County

1. The Sacramento Municipal will be used as presently constituted by the State Division of Forestry.

Sierra County

1. Class 2 at Calpine—United States Forestry Service.

Yolo County

1. The Division of Forestry Airport will be used by the State Division of Forestry in its present condition.

Yuba County

1. The State Division of Forestry will use the present Marysville Airport.

Mineral Production

The historically famous Mother Lode is situated in this Area and the amount of gold mined since the first discoveries is fabulous. Most of the counties still produce gold but the output was considerably restricted during the war. Silver, quicksilver, and chromite are also found. Of late years, more prosaic products like clay, stone, and natural gas have made up an increasingly larger percentage of the value of mineral production. Surveys have shown that the Area has large undeveloped deposits of the preceding and other minerals. In 1945 the Area ranked sixth in the value of mineral production. A complete tabulation of the value of mineral production since 1930 follows:

VALUE OF MINERAL PRODUCTION IN AREA 10

	Mineral Production	Percent of California	Percent of U. S.	Percent Change from Preceding Period
1930				
Amador.....	\$2,424,687	.66	.05	-----
El Dorado.....	2,320,233	.63	.05	-----
Nevada.....	493,243	.14	.01	-----
Placer.....	323,717	.09	.01	-----
Sacramento.....	2,303,108	.63	.05	-----
Sierra.....	605,585	.17	.01	-----
Sutter.....	-----	-----	-----	-----
Yolo.....	2,700	-----	-----	-----
Yuba.....	1,018,399	.28	.02	-----
Total.....	\$9,491,672	2.60	.20	-----
1935				
Amador.....	\$2,765,299	1.05	.08	14.05
Nevada.....	9,195,148	3.49	.25	294.75
El Dorado.....	2,388,999	.91	.07	384.35
Placer.....	1,026,451	.39	.03	217.09
Sacramento.....	4,336,763	1.65	.12	88.30
Sierra.....	860,716	.32	.02	42.13
Sutter.....	357	-----	-----	-----
Yolo.....	34,665	.01	-----	1,183.88
Yuba.....	1,841,221	.70	.05	80.80
Total.....	\$22,449,619	8.52	.62	136.52
1940				
Amador.....	\$4,284,886	1.25	.08	54.95
El Dorado.....	2,094,405	.61	.04	—12.33
Nevada.....	11,351,165	3.31	.20	23.45
Placer.....	2,023,484	.59	.04	97.13
Sacramento.....	5,928,834	1.73	.11	36.71
Sierra.....	969,323	.28	.01	12.62
Sutter.....	94,054	.03	-----	26,245.65
Yolo.....	109,820	.03	-----	216.80
Yuba.....	4,035,614	1.18	.07	119.18
Total.....	\$30,891,585	9.01	.55	37.60

VALUE OF MINERAL PRODUCTION IN AREA 10—Continued

	Mineral Production	Percent of California	Percent of U. S.	Percent Change from Preceding Period
1945				
Amador.....	\$487,544	.10	-----	—88.62
El Dorado.....	301,627	.06	-----	—85.60
Nevada.....	1,196,433	.25	-----	—89.46
Placer.....	241,359	.05	-----	—88.07
Sacramento.....	9,240,880	1.95	-----	55.86
Sierra.....	172,782	.04	-----	—82.17
Sutter.....	62,910	.02	-----	—33.11
Yolo.....	479,810	.10	-----	336.91
Yuba.....	1,186,139	.25	-----	—70.61
Total.....	\$13,369,484	2.82	-----	—56.72

Sources: *Minerals Yearbook Review of 1940*, California Division of Mines Bulletins, California State Chamber of Commerce.

The miners of '49 would doubtless be startled at the idea of riding to their diggings in a couple of hours while seated in a comfortable airplane instead of walking laboriously for days urging along a couple of burros. The doughty highway robbers of the time would have shaken their heads in disgust at the aircraft transporting gold bullion safely out of reach.

Manufacturing

Food products, clay, and printing are the principal manufacturers of the Area. War contracts stimulated many small industries which have found it profitable to continue. A summary of the value of goods manufactured in 1929 and 1939 follows:

VALUE OF MANUFACTURES IN AREA 10

	1929		1939	
	Value of Manufacturing	Percent of California	Value of Manufacturing	Percent of California
California.....	\$2,950,053,451	100.00	\$2,798,179,523	100.00
Total.....	\$81,065,640	2.75	\$79,630,757	2.84
Amador.....	345,503	.01	310,084	.01
El Dorado.....	2,336,973	.08	3,758,521	.13
Nevada.....	-----	-----	504,731	.02
Placer.....	6,530,292	.22	3,823,441	.14
Sacramento.....	63,883,097	2.17	48,185,404	1.72
Sierra.....	1,863,281	.07	2,889,395	.10
Sutter.....	1,862,655	.06	1,930,734	.07
Yolo.....	2,440,781	.08	16,152,261	.58
Yuba.....	1,803,058	.06	2,076,186	.07

Source: United States Census of Manufacturers.

Tourist and Travel Industry

There are two chief tourist attractions in the Area: One, the Mother Lode district with its ghost towns and historical associations; the other, the High Sierra, year round, mountain playground. Geographically, the two

attractions are in part conterminous. This mountain region is of great beauty, well forested and dotted with lakes. The stimulating climate attracts vacationists, campers, and sportsmen. In winter, other thousands come for the winter sports. Following is a tabulation of visitors to State Parks in the Area during 1946. Because of its nearness, a large percentage of the visitors has been drawn from the Bay Area. With better air passenger facilities many more thousands from all over the State and from the entire United States will take advantage of a chance to visit this famous mountain playground.

VISITORS TO CALIFORNIA STATE PARKS—1946
(From Table 18)

	Number of Visitors	
El Dorado		
D. L. Bliss Park.....	19,148	
Gold Discovery Site.....	12,752	
Marshall Historical Monument.....	12,500	
		44,400
Nevada		
Donner Historical Monument.....		59,560
Placer		
Tahoe Campground.....		31,020
Total.....		134,980

Source: California Department of Natural Resources, Division of Beaches and Parks.

A third tourist attraction, although highly seasonal in character, is the California State Fair, and in evaluating tourist travel into and out of the Sacramento Metropolitan Area, the large number of people drawn into Sacramento each year as a result of the Fair must be given adequate consideration. The attendance figures have risen from 188,661 in 1926, to 748,393 in 1941, the last year in which the State Fair was held; the present site is admittedly too small to accommodate the numbers of people visiting the grounds during the

last Fair year, and plans are underway to move to a site which will provide an area large enough to accommodate the anticipated increased visitors as a result of the State's population gain since 1941. It is only reasonable to assume that a portion of the State Fair visitors will fly to Sacramento, either by commercial airline or private plane, and the increased air activity in and around the Sacramento area during this two week period will create an air traffic and airplane parking problem that must be taken into account when estimating the needs of the Sacramento Metropolitan Area.

Distribution and Transportation

Railroads in the Area radiate from Sacramento as a hub. Main lines of the Southern Pacific pass through the city north and south, and east and west. The main line of the Western Pacific from San Francisco to Salt Lake City runs through Sacramento and follows the Feather River route. Branch lines connect certain outlying points with these main lines.

Highways follow somewhat the same pattern. Routes No. 99 and 24 are the main arterials north and south. Highway No. 40 passes through Donner Pass and continues east. Highway No. 50 follows the American River Canyon and skirts the southeastern side of Lake Tahoe. There are numerous side roads connecting with these. Bus lines offer service throughout the Area and reach many districts not served by railroad. Several truck lines pass through the Area and considerable freight is transported eastward out of the State by truck.

Indices of Purchasing Power

Indices of purchasing power are listed in Table 119. Bank deposits and per capita individual incomes are below the State average. Per capita automobile registrations and retail sales are well above the State average. Private planes should find a ready market in the Area.

TABLE 119
INDICES OF PURCHASING POWER FOR AREA 10
Deposits of Individuals, Partnerships, and Corporations^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Amador.....	\$4,857	.12	\$5,379	.10	\$6,277	.09	\$7,305	.08
El Dorado.....	2,970	.07	3,930	.07	5,543	.08	5,777	.07
Nevada.....	6,865	.16	7,351	.13	8,255	.11	9,851	.11
Placer.....	8,421	.20	11,161	.20	16,509	.23	20,424	.24
Sacramento.....	98,203	2.31	126,675	2.30	160,730	2.24	193,583	2.23
Sierra.....	499	.01	641	.01	777	.01	822	.01
Sutter.....	3,061	.07	5,778	.10	8,195	.11	9,567	.11
Yolo.....	10,729	.25	14,533	.27	19,601	.27	25,158	.29
Yuba.....	8,104	.19	12,948	.24	15,945	.22	19,017	.22
Totals.....	\$143,709	3.38	\$188,396	3.42	\$241,832	3.36	\$291,504	3.36

CALIFORNIA AIRPORTS

TABLE 119—Continued
Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Amador.....	\$8,575,305	\$1,010	56.20	-----	\$14,552,365	\$1,763	161.89	74.55
El Dorado.....	13,628,964	1,637	91.10	-----	15,072,850	1,413	129.75	-13.68
Nevada.....	10,044,863	948	52.75	-----	14,676,885	1,029	94.49	8.54
Placer.....	29,721,674	1,215	67.61	-----	35,359,425	1,310	120.29	7.82
Sacramento.....	178,394,240	1,256	69.89	-----	134,940,146	904	83.01	-28.03
Sierra.....	3,242,295	1,339	74.51	-----	3,143,649	1,077	98.90	-19.57
Sutter.....	23,868,188	1,633	90.87	-----	21,988,045	1,418	130.21	-13.17
Yolo.....	36,302,497	1,535	85.42	-----	33,252,695	1,335	122.59	-13.03
Yuba.....	22,658,645	2,000	111.30	-----	18,968,940	1,457	133.79	-27.15
Totals.....	\$326,436,671	\$1,328	73.90	-----	\$291,955,000	\$1,098	100.83	-17.32
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Amador.....	\$16,385,070	\$1,826	176.77	3.57	\$16,866,555	\$2,264	161.25	23.99
El Dorado.....	15,592,405	1,179	114.13	-16.56	16,039,881	1,184	84.33	.42
Nevada.....	17,683,425	917	88.77	-10.89	18,968,990	1,106	78.77	20.61
Placer.....	35,817,807	1,274	123.33	-2.75	40,842,750	1,324	94.30	3.92
Sacramento.....	150,916,620	886	85.77	-1.99	186,052,614	876	62.39	-1.13
Sierra.....	2,652,037	877	84.90	-18.57	3,228,130	1,359	96.79	54.96
Sutter.....	24,262,365	1,299	125.75	-8.39	28,774,916	1,276	90.88	-1.77
Yolo.....	36,860,293	1,353	130.98	1.35	40,882,408	1,239	88.25	-8.43
Yuba.....	19,870,850	1,167	112.97	-19.90	21,067,855	949	67.59	-18.68
Totals.....	\$320,040,872	\$1,046	101.26	-4.74	\$372,724,101	\$1,031	73.43	-1.44

Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Amador.....	2,589	.30	83.33	-----	3,077	.37	105.71	23.33
El Dorado.....	3,282	.39	108.33	-----	4,377	.41	117.14	5.13
Nevada.....	3,429	.32	88.89	-----	5,927	.42	120.00	31.25
Placer.....	9,209	.38	105.56	-----	10,018	.37	105.71	-2.63
Sacramento.....	47,932	.34	94.44	-----	51,919	.35	100.00	2.94
Sierra.....	804	.33	91.67	-----	1,134	.39	111.43	18.18
Sutter.....	6,148	.42	116.67	-----	6,551	.42	120.00	-----
Yolo.....	9,708	.41	113.89	-----	10,411	.42	120.00	2.44
Yuba.....	5,002	.44	122.22	-----	6,043	.46	131.43	4.55
Totals.....	68,103	.36	100.00	-----	99,457	.37	105.71	2.78
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Amador.....	3,585	.40	100.00	8.11	2,738	.37	119.35	-7.50
El Dorado.....	5,398	.41	103.00	-----	4,722	.35	112.90	-14.64
Nevada.....	7,668	.40	100.00	-4.76	4,893	.29	93.55	-27.50
Placer.....	12,222	.43	108.00	16.21	10,665	.35	112.90	-18.61
Sacramento.....	66,923	.39	98.00	11.42	65,225	.31	100.00	-20.51
Sierra.....	1,129	.37	93.00	-5.13	770	.32	103.23	-13.51
Sutter.....	8,092	.43	108.00	2.38	7,790	.35	112.90	-18.61
Yolo.....	12,365	.45	113.00	7.14	12,400	.38	122.58	-15.56
Yuba.....	8,031	.47	118.00	2.17	7,120	.32	103.23	-31.92
Totals.....	125,413	.41	103.00	10.81	116,323	.32	103.23	-21.96

TABLE 118—Continued
 INDICES OF PURCHASING POWER FOR AREA 10
 Per Capita Individual Incomes^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Amador.....	\$5,679	\$633	78.83	\$7,220	\$969	70.52	53.08
El Dorado.....	8,892	672	83.69	14,443	1,066	77.58	58.63
Nevada.....	11,252	584	72.73	10,521	613	44.61	4.97
Placer.....	16,482	586	72.98	32,784	1,063	77.37	81.40
Sacramento.....	133,323	783	97.51	279,668	1,316	95.78	68.07
Sierra.....	2,257	746	92.90	2,754	1,160	84.43	55.50
Sutter.....	13,372	716	89.17	31,684	1,405	102.26	96.23
Yolo.....	19,909	731	91.03	44,984	1,363	99.20	86.46
Yuba.....	10,456	614	76.46	20,496	923	67.18	50.33
Totals.....	\$221,622	\$724	90.18	\$444,554	\$1,229	89.45	69.75

Per Capita Retail Sales^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Amador.....	\$2,058	\$242	42.76	-----	\$2,616	\$317	82.77	—86.90
El Dorado.....	2,869	345	60.95	-----	3,428	321	83.81	—6.96
Nevada.....	3,821	361	63.78	-----	6,818	478	124.80	—86.76
Placer.....	9,950	407	71.91	-----	8,462	313	81.72	—23.10
Sacramento.....	82,551	581	102.65	-----	61,752	414	108.09	—28.74
Sierra.....	622	257	45.41	-----	674	231	60.31	—10.12
Sutter.....	3,026	207	36.57	-----	2,531	163	42.56	—21.26
Yolo.....	9,806	415	73.32	-----	7,613	306	79.90	—26.27
Yuba.....	10,171	898	158.66	-----	9,047	695	181.46	—22.61
Totals.....	\$124,874	\$508	89.75	-----	\$102,941	\$387	101.04	—23.82
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Amador.....	\$3,418	\$381	82.65	20.19	\$3,684	\$411	55.62	7.87
El Dorado.....	4,563	345	74.84	7.48	6,763	511	69.15	48.12
Nevada.....	8,819	457	99.13	—4.39	9,530	494	66.85	8.10
Placer.....	11,243	400	86.77	27.80	17,486	622	84.17	55.50
Sacramento.....	91,716	538	116.70	29.95	161,193	946	128.01	75.84
Sierra.....	901	298	64.64	29.00	857	283	38.29	—5.03
Sutter.....	3,792	203	44.03	24.54	7,605	407	55.07	100.49
Yolo.....	10,007	367	79.61	19.93	17,058	626	84.71	70.57
Yuba.....	11,618	682	147.94	—1.87	21,012	1,234	166.98	80.94
Totals.....	\$146,077	\$478	103.69	23.51	\$245,188	\$802	108.53	67.78

Sources: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Population

Table 120 brings out the fact that the population of the Area as a whole increased at an accelerating rate between 1930 and 1945. The estimated increases for 1950 and 1955 are at a somewhat lesser rate. Decreases in population in several of the mountain counties during the war was caused in part by restrictions on gold mining. Table 121 lists the population growth of the cities and shows the same process of urbanization for the Area that is found throughout the State.

TABLE 120
POPULATION OF AREA 10 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930 ^a				1945 ^d			
Amador.....	8,494	.15		Amador.....	7,450	.08	-16.97
El Dorado.....	8,325	.15		El Dorado.....	13,550	.15	2.43
Nevada.....	10,596	.19		Nevada.....	17,150	.19	-11.06
Placer.....	24,468	.43		Placer.....	30,850	.34	9.76
Sacramento.....	141,999	2.50		Sacramento.....	212,500	2.34	24.76
Sierra.....	2,422	.04		Sierra.....	2,375	.03	-21.49
Sutter.....	14,618	.26		Sutter.....	22,550	.25	20.72
Yolo.....	23,644	.41		Yolo.....	33,000	.36	21.13
Yuba.....	11,331	.20		Yuba.....	22,200	.24	30.26
Total Area 10.....	245,897	4.33		Total Area 10.....	361,625	3.98	18.21
1935 ^b				1950 ^e			
Amador.....	8,255	.14	-2.81	Amador.....	8,150	.08	9.40
El Dorado.....	10,670	.18	28.16	El Dorado.....	14,950	.15	10.33
Nevada.....	14,265	.23	34.62	Nevada.....	19,250	.19	12.24
Placer.....	27,000	.44	10.35	Placer.....	33,500	.34	8.59
Sacramento.....	149,255	2.45	5.11	Sacramento.....	231,000	2.33	8.71
Sierra.....	2,920	.05	20.56	Sierra.....	2,550	.03	7.37
Sutter.....	15,510	.26	6.10	Sutter.....	27,000	.27	19.73
Yolo.....	24,915	.41	5.37	Yolo.....	37,800	.38	14.55
Yuba.....	13,015	.21	14.86	Yuba.....	26,000	.26	17.12
Total Area 10.....	265,805	4.37	8.10	Total Area 10.....	400,200	4.03	10.67
1940 ^c				1955 ^f			
Amador.....	8,973	.13	8.70	Amador.....	9,025	.08	10.74
El Dorado.....	13,229	.19	23.98	El Dorado.....	16,650	.15	11.37
Nevada.....	19,283	.28	35.18	Nevada.....	21,500	.19	11.69
Placer.....	28,108	.41	4.10	Placer.....	37,375	.33	11.57
Sacramento.....	170,333	2.47	14.12	Sacramento.....	256,750	2.31	11.15
Sierra.....	3,025	.04	23.60	Sierra.....	2,800	.03	9.80
Sutter.....	18,680	.27	20.44	Sutter.....	31,250	.28	15.74
Yolo.....	27,243	.39	9.34	Yolo.....	43,150	.39	14.15
Yuba.....	17,034	.25	30.88	Yuba.....	29,250	.27	12.50
Total Area 10.....	305,908	4.43	15.09	Total Area 10.....	447,750	4.03	11.88

Source: ^a and ^c United States Census (From Table 34).

^b Midpoint of California Taxpayers' Association Estimate for January 1, 1935, and January 1, 1936.
^d Midpoint of California Taxpayers' Association Estimate for January 1, 1945, and January 1, 1946 (From Table 34).

^e and ^f Midpoint of high and low estimates, *Estimated Range for Population Growth in California to 1960*, State Reconstruction and Reemployment Commission, 1946. (From Table 34.)

Aeronautical development in the Area should take into consideration the large air freight potential of agricultural perishables and the need of adequate facilities for tourists and visitors traveling by airplane. It should also be borne in mind that the Area is a transportation center for the entire State. Many through passengers to other parts of the State pass through the Area and airports must be able to handle this traffic as well as the traffic originating or terminating locally.

TABLE 121
POPULATION STATISTICS OF AREA 10
Incorporated Places

Aviation Area, Counties and Cities	Date Incor- porated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 10.....		131,733	151,970	174,060	245,897	305,908	†397,580	
Amador County.....		11,116	9,086	7,793	8,494	8,973	†8,700	
Amador.....	1915			377	171	249		
Jackson.....	1905		2,035	1,601	2,005	2,024		
Plymouth.....	1917			657	343	460		
Sutter Creek.....	1913			920	1,013	1,134		
El Dorado County.....		8,986	7,492	6,426	8,325	13,229	†15,900	
*Placerville.....	1854	1,748	1,914	1,650	2,322†	3,064		
Nevada County.....		17,789	14,955	10,850	10,596	19,283	†20,400	
*Grass Valley.....	1861	4,719	4,520	4,006	3,817	5,701		
Nevada City.....	1851	3,250	2,689	1,782	1,701	2,445		
Placer County.....		15,786	18,237	18,584	24,468	28,108	†34,800	
*Auburn.....	1860	2,050	2,376	2,289	2,661	4,013	4,153	Oct. 24, 1946
Colfax.....	1910		621	573	912	794		
Lincoln.....	1890	1,061	1,402	1,325	2,094	2,044		
Rocklin.....	1893	1,050	1,026	643	724	795		
*Roseville.....	1909		2,608	4,477	6,425	6,653	8,309	Sept. 26, 1946
Sacramento County.....		45,915	67,806	91,029	141,999	170,333	†229,000	
Folsom.....	1946					2,000		
Galt.....	1946					700		
Isleton.....	1923				2,090	1,837		
*North Sacramento.....	1924				2,097†	3,053	3,869	Feb. 26, 1946
*Sacramento.....	1850	29,282	44,696	65,908	93,750	105,958	119,984	Dec. 12, 1945
Sierra County.....		4,017	4,098	1,783	2,422	3,025	†2,580	
Loyalton.....	1901		983	442	837	925		
Sutter County.....		5,886	6,328	10,115	14,618	18,680	†25,700	
*Yuba City.....	1878		1,160	1,708	3,605	4,968		
Yolo County.....		13,618	13,926	17,105	23,644	27,243	†34,600	
Davis.....	1917			939	1,243	1,672	2,421	April 30, 1946
Winters.....	1898	785	910	903	896	1,133		
*Woodland.....	1874	2,886	3,187	4,147	5,542	6,637		
Yuba County.....		8,620	10,042	10,375	11,331	17,034	†25,900	
*Marysville.....	1851	3,497	5,430	5,461	5,763	6,646	7,979	May 28, 1946
Wheatland.....	1874	492	481	435	479	496		

* URBAN—1940.

† Classification changed to urban in this interval.

† Estimate of California Taxpayers' Association.

TABLE 121—Continued
POPULATION STATISTICS OF AREA 10
Unincorporated Places

	Popula- tion		Popula- tion		Popula- tion
Amador County		Placer County		Sierra County	
Drytown.....	150	Alta.....	125	Alleghany.....	400
Ione.....	1,000	Applegate.....	300	Calpine.....	300
Martel.....	175	Blue Canyon.....	100	Downieville.....	325
Pinegrove.....	150	Bowman.....	250	Forest City.....	250
Volcano.....	300	Brockway.....	125	Sierra City.....	225
		Dutch Flat.....	100	Sierraville.....	150
El Dorado County		Emigrant Gap.....	150	Sutter County	
Camino.....	700	Foresthill.....	225	Live Oak.....	1,268
Coloma.....	175	Gold Run.....	125	Meridian.....	400
Diamond Springs.....	594	Iowa Hill.....	125	Nicolaus.....	100
El Dorado.....	250	Lake Tahoe.....	100	Oswald.....	150
Fair Play.....	100	Loomis.....	525	Pleasant Grove.....	250
Georgetown.....	600	Newcastle.....	775	Rio Oro.....	175
Greenwood.....	375	Penryn.....	325	Robbins.....	100
Grizzly Flat.....	100	Sheridan.....	250	Sutter.....	958
Kelsey.....	150	Tahoe.....	200		
Latrobe.....	225			Yolo County	
Lotus.....	100	Sacramento County		Broderick.....	721
Pollock Pines.....	250	Courtland.....	600	Brooks.....	125
Rescue.....	100	Del Paso.....	325	Bryte.....	1,370
Shingle.....	125	Elk Grove.....	575	Clarksburg.....	125
Smith Flat.....	175	Elverta.....	225	Dunnigan.....	150
		Fair Oaks.....	1,812	Esparto.....	675
Nevada County		Florin.....	225	Guinda.....	250
French Corral.....	125	Franklin.....	125	Knights Landing.....	649
Graniteville.....	250	Gardenland.....	1,518	Madison.....	175
Norden.....	150	Hood.....	125	Tancred.....	100
North Bloomfield.....	100	Natoma.....	125	West Sacramento.....	1,181
North Columbia.....	125	Orangevale.....	651	Yolo.....	300
North San Juan.....	150	Perkins.....	225		
Rough and Ready.....	125	Rio Linda.....	1,589	Yuba County	
Spenceville.....	150	Ryde.....	175	Browns Valley.....	150
Truckee.....	696	Walnut Grove.....	725	Brownsville.....	125
				Hammononton.....	350
				Rackerby.....	250
				Smartville.....	125

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

Only two cities, Marysville and Sacramento, are served directly by scheduled air transport, although the service area of the Marysville and Sacramento airports include 90 percent of the population of Area 10. Several communities in the area will eventually qualify for feederline service when adequate landing facilities for feeder line operations are made available. Placerville, Auburn, Jackson and the Grass Valley-Nevada City areas are the most probable future feeder line stops, although the use of airports for scheduled air service in these localities was not included as a factor in arriving at the recommendations for increased facilities, since economic justification was not apparent.

The valley section of Area 10 is well supplied with operating airports because of the level terrain which makes for easily developed facilities. The upper bench lands and the higher elevations in the eastern portion have very few airports, primarily the result of high construction costs, even though the residents relatively

have more enthusiasm for air transportation than the people in the more densely populated sections of the valley. Transportation difficulties to and from the airports in the mountainous areas, and the hazards presented by soft or snow covered runways during the winter months have seriously retarded aeronautical activity in numerous sections of the area tributary to Sacramento. Improvement of existing access roads and all weather surfacing will stimulate private and commercial aviation throughout the entire eastern section, as well as several parts of the valley proper; many of the recommendations which are outlined later have been premised upon certain of these conditions which exist in so many of the mountainous portions of Area 10.

The thirty-four existing airports in Area 10 are tabulated below with the class and ownership given for each airport; Plate M-10 shows the location of each facility in relation to the others in the Sacramento and tributary area.

<i>Plate M-10 Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
SACRAMENTO COUNTY			
10- 1	Sacramento—McClelland AAB	U. S. Army	6
10- 2	Sacramento—Mather AAFld.	U. S. Army	7
10-25	Sacramento Municipal	City of Sacramento	5
10-26	Franklin	County of Sacramento	3
10-50	Sacramento—Sky Ranch	Commercial-Private	S-2
10-51	Sacramento—Branstetter	Commercial-Private	S-2
10-52	Sacramento—Jensen	Private	1
10-53	Fair Oaks—Sky Nook	Commercial-Private	1
10-54	Fair Oaks—Phoenix	Commercial-Private	1
10-55	Perkins—Skyline	Commercial-Private	1
10-56	Walnut Grove	Commercial-Private	S-2
YOLO COUNTY			
10- 6	Davis—State Forestry	State of California	S-2
10-30	Winters—Davis Flight Strip	County of Yolo	5
10-60	Sacramento—Capitol Sky Park	Commercial-Private	1
10-61	Clarksburg—Borgas	Commercial-Private	S-2
10-62	Davis—University	Commercial-Private	S-3
10-63	Woodland—Yolo Flyers Club	Commercial-Private	2
10-64	Woodland—Air Park	Commercial-Private	S-2
SUTTER COUNTY			
10-68	Robbins—Sutter Basin Airport	Commercial-Private	1
YUBA COUNTY			
10-36	Marysville—Alicia	County of Yuba	5
10-37	Marysville—Cheim	City of Marysville	2
SIERRA COUNTY			
10-75	Calpine	Private	1
NEVADA COUNTY			
10-15	Truckee—CAA Site 16B	CAA	1
10-40	Nevada City Municipal	City of Nevada City	1
10-80	Grass Valley—Gilmore	Commercial-Private	S-1
PLACER COUNTY			
10-20	Blue Canyon—CAA Site 13	CAA	1
10-42	Auburn Municipal	City of Auburn	S-2
10-43	Lincoln Municipal	City of Lincoln	3
10-85	Roseville—Pruitt	Commercial-Private	1
10-86	Roseville—Dunbar	Commercial-Private	1
EL DORADO COUNTY			
10-45	Placerville Municipal	City of Placerville	S-2
10-90	Meyers	Commercial-Private	(under construction)
AMADOR COUNTY			
10-48	Jackson	County of Amador	S-1

The two airlines having scheduled operations at Sacramento and Marysville—United and Southwest—have a combined total of 21 daily in and out schedules from the Sacramento Municipal Airport. Southwest Airways has 4 in and out schedules from Alicia Airport at Marysville. These flights link the lower Sacramento Valley with other areas to the North, South, East and West.

Flights into and out of Marysville are given in the following tabulation:

<i>Flights in</i>	<i>From</i>	<i>Flights out</i>	<i>To</i>
2	Sacramento	2	Chico
2	Chico	2	Sacramento

Flights into and out of Sacramento are given in the following tabulation:

<i>Flights in</i>	<i>From</i>	<i>Flights out</i>	<i>To</i>
6	San Francisco	4	San Francisco
1	Ogden	4	Reno
3	Reno	3	Oakland
3	Oakland	1	Klamath Falls
2	Burbank	1	Medford
1	Klamath Falls	1	Salinas
1	Medford	2	Fresno
2	Vallejo	2	Vallejo
2	Marysville	2	Marysville
		1	Los Angeles

ESTIMATES OF SCHEDULED AIR TRAFFIC

Applying the demonstrated interest in airline passenger travel of the population within a 25 mile radius of Sacramento and Marysville to an increased use of air transport and a larger population, it is estimated that Area 10 will develop 74,963 passengers in 1950 and 109,397 in 1955, distributed as follows:

Airline Stop	Annual On and Off Passengers	
	1950	1955
Sacramento	59,405	86,285
Marysville	15,558	23,112
Total	74,963	109,397

Considering that seat use per flight will be approximately the same in 1950 and 1955 as it is now, Sacramento will need 22 daily in and out flights in 1950, and 32 in 1955. Marysville will require 6 daily in and out flights in 1950, with an increase to 9 in 1955, in order to accommodate commercial passengers.

The agricultural production of the nine Sacramento and tributary area counties offers a good air freight potential, and the following analysis of 1945 surface shipments provides estimates of future air transportation tonnage:

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Amador	None						
El Dorado	Mixed Deciduous Fruit	30	420	2	8.4	8	33.6
	Pears	1,011	15,165	0		2	303.3
	Total	1,041	15,585		8.0		337.0
Nevada	None						
Placer	Apricots	11	165	2	3.3	8	13.2
	Cherries	3	39	9	3.5	30	11.7
	Grapes	205	3,485	1	34.9	5	174.3
	Mixed Deciduous Fruit	166	2,324	2	46.5	8	185.9
	Peaches	57	684	7	47.9	23	157.3
	Pears	1,395	20,925	0		2	418.5
	Plums and Fresh Prunes	1,104	16,560	1	165.6	13	2,152.8
	Total	2,941	44,182		302.0		3,114.0
Sacramento	Apricots	4	60	2	1.2	8	4.8
	Asparagus	152	1,824	15	273.6	28	510.7
	Broccoli	7	84	0		5	4.2
	Cabbage	2	24	2	.5	7	1.7
	Celery	90	1,080	0		7	75.6
	Grapes	181	3,077	1	30.8	5	153.9
	Honeydew Melons	14	154	0		2	3.1
	Lettuce and Romaine	5	60	6	3.6	18	10.8
	Mixed Deciduous Fruit	43	603	2	12.0	8	48.2
	Mixed Vegetables	30	360	0		6	21.6
	Peaches	3	36	7	2.5	23	8.3
	Pears	1,697	25,455	0		2	509.1
	Peas, Green	502	5,020	3	150.6	17	853.4
	Plums and Fresh Prunes	47	705	1	7.1	13	91.7
	Tomatoes	772	10,036	23	2,308.3	43	4,315.5
	Total	3,549	48,577		2,790.0		6,613.0
Sierra	None						
Sutter	Apricot	8	120	2	2.4	8	9.6
	Casabas	2	22	0		2	.4
	Honeydew Melons	280	3,080	0		2	61.6
	Mixed Deciduous Fruit	21	294	2	5.9	8	23.5
	Mixed Melons	92	1,012	0		2	20.2
	Peaches	81	972	7	68.0	23	223.6
	Pears	160	2,400	0		2	48.0
	Persian Melons	159	1,749	0		2	35.0
	Plums and Fresh Prunes	67	1,005	1	10.1	13	130.7
	Total	870	10,654		86.0		553.0

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Yolo	Cantaloupes	95	1,045	2	20.9	8	83.6
	Grapes	50	850	1	8.5	5	42.5
	Honeydew Melons	588	6,468	0		2	129.4
	Mixed Deciduous Fruit	35	490	2	9.8	8	39.2
	Mixed Melons	8	88	0		2	1.8
	Pears	35	525	0		2	10.5
	Peas, Green	50	500	3	15.0	17	85.0
	Plums and Fresh Prunes	21	315	1	3.2	13	41.0
	Tomatoes	57	741	23	170.4	43	318.6
	Total	939	11,022		228.0		752.0
Yuba	Peaches	19	228	7	16.0	23	52.4
	Pears	243	3,645	0		2	72.9
	Plums and Fresh Prunes	11	165	1	1.7	13	21.5
	Total	273	4,038		18.0		147.0
Area Total		9,613	134,058		3,432.0		11,516.0

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

The following possible daily schedules are established by converting the foregoing tonnage figures into airplane loads:

Converting these schedule estimates into average

between daily loads of DC-3 and DC-4 types of aircraft, it is estimated that the Area's agricultural production will require the service of approximately 6 schedules per day in 1950 and 20 in 1955.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES—AREA 10

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total		3,432	1,373	9	392	2
Amador						
El Dorado	181	8	3	.03	1	.01
Nevada						
Placer	262	302	121	.92	27	.21
Sacramento	307	2,790	1,116	7.27	246	1.59
Sierra						
Sutter	273	86	35	.26	7	.05
Yolo	250	228	91	.73	20	.16
Yuba	273	18	7	.05	1	.01
1955 Total		11,516	4,607	33	1,015	7
Amador						
El Dorado	181	337	135	1.49	30	.33
Nevada						
Placer	262	3,114	1,246	9.51	274	2.09
Sacramento	307	6,613	2,645	17.23	583	3.80
Sierra						
Sutter	273	553	221	1.62	49	.36
Yolo	250	752	301	2.41	66	.53
Yuba	273	147	59	.43	13	.10

Source: Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

PRIVATE FLYING ESTIMATES

Based upon a combination of economic buying potential and current private plane per capita ownership, the anticipated private plane ownership for 1950 and 1955 in Area 10 will be distributed as follows:

County	Index	Private Plane Ownership	
		1950	1955
Amador	57	10	22
El Dorado	71	21	49
Nevada	64	23	57
Placer	104	67	156
Sacramento	108	481	1,106
Sierra	48	2	4
Sutter	125	65	155
Yolo	148	97	231
Yuba	134	69	160
Total		835	1,940

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in the Non-Scheduled Aviation Projection, Part V:

AMADOR COUNTY			
Township	Pct.	1950	1955
1	40.56	4	9
2	24.48	2	5
3	6.73	1	1
4	20.67	2	5
5	7.56	1	2

EL DORADO COUNTY			
Township	Pct.	1950	1955
Coloma	2.35	1	1
Cosumnes	1.66	-	1
Diamond Springs	5.34	1	3
Georgetown	5.00	1	2
Greenwood	2.18	1	1
Kelsey	1.66	-	1
Lake Valley	9.13	2	5
Mountain .....	.63	-	-
Mud Springs	10.77	2	5
Placerville	58.54	12	29
Salmon Falls .....	.43	-	-
White Oak	2.31	1	1

NEVADA COUNTY			
Township	Pct.	1950	1955
Bloomfield .....	.38	-	-
Bridgeport .....	.89	-	1
Eureka .....	.21	-	-
Grass Valley	63.87	15	36
Little York .....	.06	-	-
Meadow Lake	4.89	1	3
Nevada	26.48	6	15
Rough and Ready	2.52	1	2
Washington .....	.70	-	-

PLACER COUNTY			
Township	Pct.	1950	1955
1	32.80	22	51
3	23.22	15	36
4	2.32	2	4
5	1.56	1	2
9	5.69	4	9
10	7.36	5	11
11	11.65	8	18
13	6.70	4	11
14	8.70	6	14

SACRAMENTO COUNTY			
Township	Pct.	1950	1955
American	8.48	41	94
Brighton	6.41	31	71
Center	6.84	33	76
Georgiana	2.93	14	32
Granite	2.30	11	26
Lee	1.02	5	11
Sacramento	66.47	320	735
San Joaquin	5.55	26	61

SIERRA COUNTY			
Township	Pct.	1950	1955
Butte	4.78	-	-
Downieville	23.16	1	1
Forest	17.76	-	1
Loyalton	40.14	-	2
Sierra	13.41	-	-
Table Rock .....	.75	-	-

SUTTER COUNTY			
Township	Pct.	1950	1955
Butte	11.48	7	18
Nicolaus	6.66	4	10
Sutter	11.02	7	17
Vernon	11.59	8	18
Yuba	59.25	39	92

YOLO COUNTY			
Township	Pct.	1950	1955
Blacks .....	.97	1	2
Cacheville	1.83	2	4
Capay .....	.74	1	2
Clarksburg	9.65	9	22
Cottonwood	1.02	1	2
Dunnigan .....	.71	1	2
Esparto	1.69	2	4
Grafton	3.76	4	9
Guinda .....	.68	1	2
Putah	17.97	17	41
Washington	12.73	12	29
Winters	5.44	5	13
Woodland	42.81	41	99

YUBA COUNTY			
Township	Pct.	1950	1955
Camptonville .....	.71	1	1
Marysville	94.38	65	151
Wheatland	4.91	3	8

AIRPORT REQUIREMENTS

The thirty-four airports serving Area 10 are presently adequate in number provided that some of the facilities are brought up to Civil Aeronautics Administration standards. Many fields need lengthening, widening and surfacing of runways, elimination of glide-path hazards and other physical improvements before they can be termed adequate for their service area. As aviation activity increases, several areas will be able to justify the creation of new airports where none now

exist; other areas will need increased services from established airports, while the Sacramento Metropolitan Area will need both increased services and several new facilities.

The recommendations for the various sections of Area 10, which are made later in this Area Treatment, include only those areas indicating a need for new development or increased services; those communities or sections having facilities which, with minor improve-

ments, are considered adequate for the period under study are not included in the following paragraphs.

AMADOR COUNTY

Jackson-Sutter Creek

The central section of Amador County is served by a sub-standard Class 1 airport, county owned. Improvements thereto are contemplated in the immediate future, under the National Airport Plan and Program of 1947; these include extensive grading and runway improvements to meet Class 1 standards. Since this is the only airport in Amador County, these improvements are amply justified, and vitally necessary to provide a minimum required aviation facilities in this region. In line with recommendations contained in the body of this report, and with the needs of the Forest Services in this area, this airport should ultimately be developed to meet Class 2 specifications, thus providing adequate facilities for larger charter and commercial aircraft, as well as the smaller types of feeder line aircraft. This western foot-hill section of California has relatively few aviation facilities, and the improvement to Class 2 specifications of at least one airport in each county is the basis of a recommendation contained in the Conclusions, Part VI.

EL DORADO COUNTY

Placerville

The only existing airport in all of El Dorado County, a substandard Class 1, is located at Placerville. With a total 1946 estimated county population of nearly 15,000 and a 1955 plane potential of 49 airplanes, the area should be served with a Class 2 facility at the earliest possible date. Although located only relatively minor distances from the more populous valley cities, private air transportation offers a great convenience to residents in, and immediately adjacent to the City of Placerville; when better facilities, both an airport itself and access to an airport, are made available to those who would utilize this faster method of transportation, air activity will increase correspondingly. The forest services have also indicated a desire for a more suitable airport in this area.

Meyers

The northeastern portion of El Dorado County borders on the famous Lake Tahoe, and contains approximately half of the many resorts of that region, which are heavily populated during the summer months. There has long been a demand for suitable airport facilities to serve the southern end of the Lake Tahoe resort area. Suitable sites are known to exist in the vicinity of Meyers in El Dorado County, where a private airport is under construction, and also immediately adjacent to the south end of Lake Tahoe on the Nevada side of the State line, where a landing strip has been used intermittently for the past ten years, but

where no improvements have ever been made which would qualify this strip as an airport. Several serious accidents have resulted from the use of this sub-standard field by those desiring to utilize air transportation to the Lake Tahoe region. The 1947 National Airport Plan proposes the establishment of a Class 2 Airport at the Meyers site in El Dorado County, in which this report concurs. The facility proposed for this location would serve aviation throughout California and Nevada to a greater extent than it would serve the people of El Dorado County. For this reason, the expense of providing this facility should be borne by a much larger area than the county itself represents. This is an excellent example of a necessary airport improvement which should have substantial aid from the State of California.

NEVADA COUNTY

Nevada City

The present Class 1 airport at Nevada City serves the townships of Nevada, Bloomfield and Bridgeport in Nevada County, as well as a small part of southwestern Sierra County. This airport would sufficiently serve the present and early anticipated needs of the area, but outside interests such as business visitors and vacationists, will create a need for a Class 2 facility. The United States Forest Service has expressed an interest in this field and would sponsor the expansion if there are no local funds, or if it becomes necessary to assist the local community, provided that matching funds were made available to that agency. The National Airport Plan of 1947 anticipates minor improvements to the existing airport which would provide a fully equipped Class 1 airport by 1950. Improvement to this extent is considered an absolute essential for that date, to accommodate the anticipated private aircraft ownership in the service area of this airport. In keeping with general recommendations of this report, and with the anticipated 1955 air traffic throughout the State of California, together with the requirements of the Forest Services, it is considered necessary that this facility be expanded to a full Class 2 airport by 1955.

Grass Valley

The oldest commercial airport in the west is the claim made for the airport in Grass Valley which has seen but little development since it was first established in 1907. If the present airport is brought up to Civil Aeronautics Administration standards, it should adequately serve the aviation needs of the lower portion of southwestern Nevada County.

Truckee

The community of Truckee is near the summit of the eastern slope of the Sierra Nevada Mountains, directly on Green 3 Civil Airway between Sacramento, California and Reno, Nevada. It is located in territory which has, throughout the history of aviation, been considered hazardous flying terrain. Consequently, the

Civil Aeronautics Administration has maintained an intermediate landing field (CAA Site 16-B) at this location since the early days of the air mail service. The field is now considered too small for modern transport aircraft, and in the interests of safety, as well as to provide a much needed aerial gateway to the northern Lake Tahoe region, it has been considered advisable that the present facility be abandoned and a modern Class 3 airport constructed a few miles to the south of the present site in much more open terrain. Such relocation would provide more favorable clearances for maneuvering large aircraft, and place the proposed facility within easy driving distances of the resorts at the north end of Lake Tahoe. For these reasons the proposed facility appears in the long range plans of the National Airport Program. The territory is also richly forested, for which reason Forest Services are greatly interested in the establishment of an adequate airport at this location. While it is not anticipated that funds will be available for the immediate construction of the proposed airport, it should be included in the proposed construction to be accomplished by the year 1955.

PLACER COUNTY

Auburn

The present facility, a substandard Class 2, has been maintained for many years by the Civil Aeronautics Administration as Intermediate Field (CAA Site 10). The city of Auburn is acquiring the property for the conversion of this field to a Municipal Airport, and the National Airport Plan of 1947 proposes the necessary improvement to complete the conversion desired.

Forest Hill

An extremely rough and mountainous section of Placer County is represented by the Forest Hill-Michigan Bluff area in the central part of the county. Although an airport for this area cannot be justified by local need, it may be justified for fire suppression and control work by the forestry services, and a Class 2 facility has been requested by the United States Forest Service. A great recreational region surrounds Forest Hill. Development of air travel to this section might be expected during the next ten years if suitable landing facilities are provided.

SIERRA COUNTY

Calpine

The sparsely populated Sierra County has had a substandard Class 1 airport at Calpine for many years, though there has been a relatively small amount of aviation activity. The estimated 1946 population of 2,490 is diffused throughout the county, with the greatest concentration being at the towns of Loyalton and Downieville, some 47 miles apart. The recommendation for a Class 2 airport is not based upon the present or anticipated needs of Sierra County as a Class 1 would suffice; however, visitors from without the area,

principally vacationists, and the United States Forest Service would require more adequate facilities than would be provided by a minimum sized airport and provisions for the use of this field by larger aircraft would greatly increase its utility. Relatively few suitable airport sites exist in this area and emergency landing facilities are almost completely lacking, for which reason the development of an adequate airport at Calpine may be justified from the standpoint of increased safety to air travel.

SUTTER COUNTY

Nicolaus

See Treatment under Sacramento Metropolitan Treatment.

YOLO COUNTY

West Sacramento

That portion of Yolo County to the immediate west of Sacramento, which contains the communities of Broderick, Bryte and West Sacramento, is presently served by Capitol Sky Park. This is a Class 1 airport close to the central business district of Sacramento City, having a service area that includes, not only Washington Township in Yolo County, but also a part of the City of Sacramento. Projections of private plane ownership clearly indicate that the existing airport will reach its capacity shortly after 1950, and a second facility is recommended for the Washington Township by 1955.

Davis University

This airport has shown remarkable growth during its existence and projections indicate that a full Class 3 facility will be justified at this location by 1955, notwithstanding the immediate proximity of Winters-Davis Flight Strip which shares in the anticipated development of this area during the period under report.

Winters-Davis Flight Strip

This facility, recently acquired as war surplus by the County of Yolo, makes excellent provision for scheduled and non-scheduled requirements of the territory immediate adjacent thereto. While no additional physical development of the property is anticipated, there is need for additional housing and other items not considered in the scope of this report, to secure maximum utility of this site.

Woodland Air Park

Projection of potential plane ownership for Woodland and Woodland Township (41 in 1950 and 99 in 1955) indicate the need for the development of a fully equipped Class 2 facility at this location in the interval 1950-1955. Aeronautical interest throughout Yolo County has been well above the State average, and is expected to continue to the extent necessary to justify this recommended expansion.

YUBA COUNTY

Dobbins-Oregon House

The north central portion of Yuba County, while not heavily populated, will eventually have need for a small airport for basing private planes. The distance of 35 to 50 miles from this area to Marysville, the nearest center of population, makes desirable the facilities which would provide more rapid transportation from this somewhat isolated section to other parts of California. Consideration to the development of a Class 1 Airport by 1955 is recommended.

SACRAMENTO METROPOLITAN AREA

While Area 10 has been referred to as the Sacramento Metropolitan Area for purposes of identification, and because all of its counties are tributary to Sacramento city, the territory being considered in the following treatment is that within a twenty-five mile radius of Sacramento Post Office, the territory normally considered in long range plans for the city's future.

The population of Sacramento County is rapidly approaching the quarter-million mark, and is heavily concentrated in the immediate vicinity of the Capitol City. The fifty-mile circle embraces nearly all of Sacramento County, the eastern half of Yolo County and small segments of Solano, Sutter and Placer Counties—with a combined population of 257,000. The present aircraft ownership of 8.88 per 10,000 persons (or approximately 225 aircraft) is expected to reach 500 by 1950 and 1,200 by 1955. The capacity of the seven civil airports now serving Sacramento city and environs, will be reached by 1950, and the projection for 1955 indicates the need for a like number of new facilities by that year. In detailing these requirements the area has been considered in four Sectors—North, South, East and West—and existing airports evaluated with respect to projected needs. Individual treatment upon that basis follows:

Sacramento Northern Sector

Branstetter—This privately owned commercial substandard Class 2 airport is located 3 miles NNW of Sacramento in the American Township and is presently serving an estimated population of 25,000. Branstetter Airport is the only facility serving the territory contiguous to Sacramento on the north. It has a service area embracing North Sacramento and all of American Township, with a potential aircraft ownership of 41 in 1950 and 94 in 1955. These figures indicate the need for the early improvement of this airport to full Class 2 standards, and if the 1955 estimate is reached it will represent the approximate capacity of the facility.

Nicolaus-Trowbridge-Rio Oso—The southernmost portion of Yuba County and the section of Sutter County to the immediate south is a rich agricultural

area with a 1946 population estimated at 2,500. Residents to the immediate west of the Feather River would also use an airport if located reasonably close to the bridge crossing at Nicolaus. A plane ownership potential of residents in the Nicolaus Township amounts to 10 airplanes in 1955; this potential should be recognized in considering the establishment of a Class 1 field in this area by 1955, although the need for the facility may become apparent before that time. This territory is midway between Sacramento and Marysville on a direct airline between the two cities and approximately twenty miles from each. The nearest aviation facilities are the new airport at Lincoln, approximately fifteen miles to the east and Woodland, ten miles to the southwest. The establishment of the proposed airport would therefore serve an area otherwise devoid of convenient aviation facilities.

Sacramento Southern Sector

Sky Ranch—Servicing the western half of Brighton Township and the area to the south of Sacramento City, the Sky Ranch Airport, a Private substandard Class 2, should be improved to meet Class 2 specifications. The territory tributary to this airport has a projected plane ownership of approximately 75 airplanes by 1950 and 150 in 1955, dependent in both instances upon the number drawn from the City of Sacramento. These figures indicate that the capacity of this airport as a Class 2 facility will be reached prior to the year 1955.

Sacramento Municipal—Projections of private plane ownership, for the area serviced by Sky Ranch and the Sacramento Municipal, indicate a definite need for another facility in the southern portion of the Sacramento Metropolitan Area prior to 1955, in order to meet the minimum needs of this section by that time. The Sacramento Municipal Airport will probably be able to carry its proportionate share of the private and all of the commercial aviation activity up to 1955. However, during the period between 1950 and 1955 the Municipal field will reach its capacity for private flying, as will the Sacramento Sky Ranch, and provisions should be made for the establishment of an air park in the general area south of the City of Sacramento by 1952.

South Sacramento—In keeping with the policy of this report, no specific site is being considered but the general recommendation is made that a modern air park be planned for this area at a suitable location to provide for the excess which is expected to develop by the year 1955. An opportunity exists here for the design and construction of a facility which can become a real community asset. Accordingly, recommendation is made for the development of a new Class 1 airport in this general location, near the end of the period covered by this study.

Franklin—Near the southern border of the county, and on the fringe of the Metropolitan Area is located an excellent Class 3 airport recently allocated to Sacramento County from the War Surplus list of airports. Constructed as an auxiliary to Stockton Army Air Field, it is now available to civil use and should provide adequate airport coverage for the entire southern portion of Sacramento County and the northern portion of San Joaquin County. No additions are considered necessary in this vicinity during the period of this study.

Eastern Sector

Sky Line (Perkins)—The eastern half of Brighton Township and a portion of Granite and Sacramento Townships are presently served by a Class 1 facility at Sky Line (Perkins) Airport, which should reach its capacity by 1950. Projections for this territory indicate an aircraft registration of approximately 100 in 1950, which will tax the capacity of existing facilities and 225 by 1955 which indicates the need for at least two

additional air parks, for which reason development of a Class 1 airport at an East Sacramento site by 1955, and improvement of Fair Oaks-Phoenix to a Class 2 by 1950 is recommended in the following summary.

Fair Oaks-Phoenix—Much of the excess anticipated after 1950 might be accommodated at Fair Oaks-Phoenix Airport, an existing Private Class 1 facility, having excellent possibilities for expansion to a Class 2 or larger airport. It is ideally located for the development of a facility adequate to care for the overflow from Sky Line Airport which may be anticipated in the interval 1950-1955. The foregoing proposed developments should provide for the needs of the territory east of Sacramento to the year 1955 only. Unquestionably long range plans should be made in anticipation of even greater development near the close of the period.

Western Sector

See treatment under "Yolo County."

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 10

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Amador County Jackson	Sutter Creek	Public	S-1	2	R,FS,NS		
El Dorado County Placerville Meyers		Public	S-1	2 2	R,FS,NS R,FS,NS,FP		
Nevada County Nevada City Grass Valley Truckee		Public Private C.A.A.	1 S-1 1			2	R,FS,NS,FP
	C.A.A. Site 16B			1 2	R,NS R,FS,NS		
Placer County Auburn Forest Hill		Public	S-2	2	R,FS,NS	2	R,FS
Sierra County Calpine		Private	(S-1)	1	R,FS,NS	2	R,FS,NS
Sutter County Nicolaus						1	NS
Yolo County West Sacramento Davis University Woodland				1	R,NS		
	Air Park	Private Private	S-3 S-2	2	NS	3	CP,NS
Yuba County Dobbins—Oregon House						1	NS
Sacramento County Branstetter Sky Ranch South Sacramento Fair Oaks East Sacramento		Private Private Private	S-2 S-2 1	2 2 2	R,NS R,NS NS	1 1 1	R,NS R,NS R,NS

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.
() Where bracketed existing Private Airports are not included in Civil Airport Count.

APPENDIX 11

AREA 11—REDWOOD EMPIRE

DESCRIPTION OF AREA

Commonly known as the North Coast Area the counties of Del Norte, Humboldt, Mendocino and Lake have been combined into Area Eleven because of their geographic similarity and economic interdependence. From the extreme northwestern corner of the State, adjoining the Oregon border, to the southern boundary of Mendocino and Lake counties, the Area's western border is on the Pacific Ocean; to the east lie the counties of Yolo, Colusa, Glenn, Tehama, Trinity and Siskiyou.

Comprising an area of nearly 6 million acres, or 6 percent of the total state acreage, the land is about equally divided into farm, other private land and publicly owned acreage. The land usage is shown in the following tabulation, from Table 15:

<i>Usage</i>	<i>Acres</i>	<i>Percent of Total</i>
Total Area-----	5,978,880	100.
Total privately owned---	4,140,792	69.26
Land in farms-----	2,052,102	
Forest and other-----	2,088,690	
Total publicly owned---	1,838,088	30.74
National Forests-Parks	974,025	
Other Public Lands---	864,063	

Most of the region is forested and mountainous although in many sections there are fertile coastal plains and mountain valleys. The area has many rivers and streams and some of the largest are the South Klamath, Eel, Trinity, Mad, Mattole and Russian Rivers. The climate along the coast is mild, moist and cool while further inland, summer temperatures are warmer and the winters cooler with some snow in the mountain areas. Climatic data is shown on the following chart, with the cities listed being representative of the various sections in the area.

Area Eleven represents about two-thirds of the famous Redwood Empire and recreational areas abound throughout the region. Parks, beaches and scenic spots are scattered profusely in the counties of Del Norte, Humboldt, Mendocino and Lake and many tourist accommodations and resorts cater to millions of visitors each year. The entire area is a sportsman's paradise; for the fisherman salmon and steelhead are to be found in the larger rivers, black bass and cod are in off-shore waters, along the shores is the famous abalone and many

varieties of trout are to be had in the mountain streams and lakes; for the hunter there are deer, bear, mountain lion, ducks and other wild birds.

Of the many recreational areas in this north coastal region only a few attractions are included in this brief summary. The largest body of water within California is Clear Lake in the southeastern section and water sports of all kinds rate high in the vacation schedule of many a visitor. The three coastal counties, where 96 percent of all the coast redwoods grow, contain scores of redwood groves which have been preserved for all time for the enjoyment of visitors. Table 18, Section 5, Part II, shows that there were nearly a million visitors to the twenty-four State Parks in Area Eleven for the period January 1 to October 1, 1946.

Mineral Spring resorts offer various combinations of mineral baths and mineral waters, and in addition to these springs there are numerous other resorts in the densely wooded forests for those vacationers who enjoy horseback riding, hiking and similar recreation.

Resources

Area 11 is blessed with a wealth of natural resources and advantages. Five natural harbors, off-shore fishing grounds, agricultural and dairying sections, a vast supply of timber, recreational areas equal to, and in some instances surpassing, those which are more internationally known, are some of the more important resources of these north-coastal counties.

Of the fourteen Aviation Areas in the State this area has been the least productive in total value of minerals produced, and nearly seventy years of mineral production has had a total value of but \$38,832,898; quicksilver, miscellaneous stone, mineral water and gold made up the bulk of the total. The entire area has great potential mineral wealth but transportation problems and subsequent high costs of reaching markets have been the major obstacle to commercial development. In addition to the minerals above mentioned, there is a possibility of future development and production of copper, platinum and pottery clay.

With 50 billion board feet of the coastal redwoods and nearly 30 billion board feet of other species of old growth timber, it naturally follows that the primary

<i>County</i>	<i>Station</i>	<i>Station Elevation- Feet</i>	<i>Average Rainfall Inches</i>	<i>Temperature Monthly Averages of January</i>		<i>Degrees F. Daily Extremes July</i>	
				<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>
Del Norte	Crescent City----	125	75.04	38.7	53.3	50.1	68.6
Humboldt	Eureka -----	62	38.49	41.1	53.1	51.6	59.9
Lake	Clearlake Park-----	1,350	4.50	32.5	52.2	57.0	93.1
Mendocino	Ukiah -----	650	35.27	34.7	55.4	50.9	94.0

Source: United States Weather Bureau, United States Department of Commerce.

resource of this area is the great amount of commercially available timber. Nearly one-third of the State's available supply of commercial timber is located within these four counties, which produced over 28 percent of the 2,260,792,000 board feet of lumber production in California in 1945. A large amount of the redwood timber is lost to the industry during the logging and saw milling operations, and although the past wastage has not had a detrimental effect upon the economy of the area, there is an ever-increasing realization that there must be a better utilization of timber and its products. The 57,282,820,000 board feet of commercially available timber will provide a solid base for the economy of Area 11 if sound forest practices are followed and new techniques are developed for more complete use of present timber and lumber waste.

For the proper care and protection of these valuable forest lands, the Federal and State Forestry Services have requested the following airport facilities:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 11 by Counties

Del Norte County

1. Class 1 at Smith River—State Division of Forestry.
2. Class 1 at Requa—State Division of Forestry.
3. Class 1 at Del Norte State Park—State Division of Forestry.
4. Class 2 at Gasquet—United States Forest Service. State Division of Forestry will use Crescent City Airport in its present condition.

Lake County

1. Class 1 at Reiff—State Division of Forestry.
2. Class 1 at Bachelor (Upper Lake)—State Division of Forestry.
3. Class 1 at Clear Lake (Stubbs)—State Division of Forestry.
4. Class 1 at Bartlett Springs (8 mi. east)—State Division of Forestry. The State Division of Forestry will use Lakeport, Hoberg's and Middletown Airports in their present condition. The United States Forest Service will use Hoberg's and Gravelly Valley Airports in their existing condition.

Humboldt County

1. Class 1 at Klamath—State Division of Forestry.
2. Class 1 at Big Lagoon—State Division of Forestry.
3. Class 1 at Redwood Creek—State Division of Forestry.
4. Class 1 at Hoopa—State Division of Forestry.
5. Class 1 at Kneeland—State Division of Forestry.
6. Class 1 at Mad River (Big Bend)—State Division of Forestry.
7. Class 1 at Korbel (SE 10 Miles)—State Division of Forestry.
8. Class 1 at Larrabee Creek—State Division of Forestry.
9. Class 1 at Fort Seward—State Division of Forestry.
10. Class 1 at Petrolia—State Division of Forestry.
11. Class 1 at Etnersburg—State Division of Forestry.
12. Class 2 at Orleans—United States Forest Service. The State Division of Forestry will use the Eureka, Rohnerville, Scotia, and Garberville Airports in their existing condition. The United States Forest Service will use the Eureka Airport in its present condition.

Mendocino County

1. Class 1 at Usal Creek—State Division of Forestry.
2. Class 1 at Eden Creek—State Division of Forestry.
3. Class 1 at Comptche—State Division of Forestry.
4. Class 1 at Boonville—State Division of Forestry.
5. Class 1 at Manchester—State Division of Forestry.
6. Class 2 at Willits—United States Forest Service. The State Division of Forestry will use Fort Bragg, Covelo, Laytonville, Ukiah and Willits Airports in their present condition. The United States Forest Service will use Covelo, Ukiah and Mendocino Airports in their existing condition.

Agriculture

Slightly more than one-third of the total Area is in farm land but only a limited acreage is under cultivation. Because of the cool summers, mild winters, abundant rainfall and year-round green pastures the western portion of Aviation Area 11 is especially adapted to dairying, the principal income producer, and livestock production which ranks next in importance in agricultural income. Sheep, lambs and wool account for most of the livestock production, leading beef cattle, poultry and poultry products in value. Fruits, apples and pears, nuts, berries, nursery stock, seeds and—a recent development—the growing of Easter Lily bulbs, contribute to the gross farm income, which amounted to \$31,398,000 in 1945, as shown in the following tabulation from Table 40:

GROSS CASH FARM INCOME—1940 AND 1945

(In thousands of dollars)

	1940			1945			Percent change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	\$8,343,000	-----	100.00	\$20,780,900	-----	100.00	149.08
California.....	\$672,926	100.00	8.06	\$1,786,497	100.00	8.60	165.48
Del Norte.....	535	.08	.01	1,036	.06	-----	93.64
Humboldt.....	6,100	.90	.07	13,494	.75	.06	121.21
Lake.....	2,000	.30	.02	5,316	.30	.03	165.80
Mendocino.....	5,000	.74	.06	11,552	.65	.06	131.04
Total Area 11.....	\$13,635	2.02	.16	31,398	1.76	.15	130.27

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States*, 1946.

Industry

The 1939 census lists 154 manufacturing establishments located in the counties of Del Norte, Humboldt, Mendocino and Lake; 68 were engaged in food manufacturing and 55 in lumbering. Other industries were engaged in printing and publishing, iron and steel products, machinery, chemical products and wool textile products. Since 1939 many new factories, sawmills and commercial fishing, processing and canning plants have been completed and are now in production.

Of the fourteen aviation areas in California, Area Eleven is the top ranking lumber producer and cut a total of 642,988,000 board feet of lumber in 1945—over 28 per cent of the 1945 output for the entire state. Practically all of the lumber is shipped out of the area in dimension lengths and there were but three establishments in 1939 that remanufactured basic lumber into finished wood products. There are possibilities for unlimited development in this field and as more uses for waste timber and lumber are found new industries will locate in this area because of the tremendous amount of raw material. However, further industrial development will be retarded as long as the transportation difficulties and subsequent high costs of reaching markets remain as a major obstacle to competitive manufacturers in this area. Air freight has much to offer these north-coastal counties and it will contribute materially to the Area's future development.

Commercial fishing with attendant processing has expanded materially during the past several years and the fishing fleets, which operate off the coast of Area Eleven, contain over 250 boats. As better harbor facilities are provided for commercial operations the fishing industry will expand and become even more important as a major contributing industry to the economy of the region. The transportation of fresh sea food by air, as an activity, is just beginning to be utilized and as air transport develops there will be considerable export of fresh sea food from ports along the Northern California coast, principally Crescent City and Eureka. When it is considered that all of California's fresh sea food is consumed within California and but very little is exported out of the state, excepting canned products, it can be readily realized that an immensely increased fishing activity can result from increased markets for the fisherman's products.

Commerce

Practically all trade flows south and only a negligible amount of trade is carried on with communities to the north or east. Physical barriers have been responsible for the nominal isolation of the coastal counties from the rest of California and it was one of the last frontiers of the Nation to be opened to the tourist and vacationist. Although commercial activity has been

carried on between this area and the rest of the world for nearly a century it was by means of water transportation along the coast; it has only been within recent years that railway transportation has been available to two of the four counties and only more recently have adequate roads been built so that there could be increased commerce with areas to the north and east as well as to southern points.

Transportation

The Northwestern Pacific Railway, connecting San Francisco and Eureka serves Mendocino County and part of Humboldt County as far north as Eureka; and although railroad transportation serves but a portion of Area Eleven, U. S. Highways 101, 199 and 299, and State Routes 1, 20, 29, 36, 53, and 96 provide access to the north, south and east for trucks, private cars and buses. Humboldt Bay, Crescent City, Caspar, Anchorage and Fort Bragg Landing are harbors which have some water-borne traffic.

This north coast region is mountainous, which makes surface travel slow and tiresome to the individual on a business trip or the vacationist destined for a specific recreational spot. Time is of extreme importance to the business man, and to a lesser extent to the vacationist who desires to go to a particular place. In no part of California does aviation lend itself better to the saving of time than in a mountainous country, and aviation will mean much to Area 11 with its mountainous terrain, productive valleys, and recreational spots. The proper spacing of airports throughout these four counties is imperative in order to serve the greatest number of people.

Natural Air Routes

There are no civil airways in Area 11, but a number of natural air routes are in existence. The best routes lie along the coast, or a short distance inland, following through Ukiah, Willits, Garberville, Eureka and Crescent City; several others cut across the coast range into the Sacramento Valley via Weaverville to Redding and Red Bluff, and Ukiah to Williams via Clear Lake. The coast range is a rather formidable barrier to surface transportation between the coastal area, and the Northern Sacramento Valley sections; the topography of the entire length of Area 11 is rough, and cut with many creeks, rivers and deep precipitous canyons. Because of the nature of the terrain throughout the four counties, the most feasible airways were established at an early date by aircraft flying over the area.

Indices of Purchasing Power

The assessed valuation of the four counties was \$114,965,514 in 1930, while in 1940 this figure fell off to \$85,627,549 but regained part of the loss by 1945

with an assessed valuation of \$89,389,547. The average inside tax rate of \$1.897, and an outside tax rate of \$2.10 raised \$3,023,850 for the fiscal year 1945-46.

Table 122 reflects the individual wealth in Area 11

in relation to the State average. It is significant to note that per capita automobile and truck registrations exceed the State average, and additional gains are recorded in deposits and per capita retail sales.

TABLE 122
INDICES OF PURCHASING POWER FOR AREA 11
Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Del Norte.....	\$1,161	.03	\$1,386	.03	\$1,575	.02	\$2,352	.03
Humboldt.....	18,974	.45	23,746	.43	32,509	.45	39,196	.45
Lake.....	2,050	.05	3,014	.05	4,886	.07	4,994	.06
Mendocino.....	7,141	.16	8,608	.16	12,318	.17	16,058	.18
Totals.....	\$29,326	.69	\$36,754	.67	\$51,288	.71	\$62,600	.72

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Del Norte.....	\$2,294	\$483	60.15	\$3,255	\$845	61.50	74.95
Humboldt.....	32,230	704	87.67	61,734	1,183	86.10	68.04
Lake.....	4,269	529	65.88	8,652	911	66.30	72.21
Mendocino.....	14,888	534	66.50	27,382	890	64.77	66.67
Totals.....	\$53,681	\$621	77.35	\$101,023	\$1,049	76.35	68.92

Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Del Norte.....	\$11,545,756	\$2,436	135.56	-----	\$10,265,681	\$2,161	198.44	—11.29
Humboldt.....	61,878,100	1,431	79.63	-----	51,280,079	1,169	107.35	—18.31
Lake.....	11,204,305	1,564	87.03	-----	8,812,170	1,071	98.35	—31.52
Mendocino.....	30,337,353	1,291	71.84	-----	26,342,416	1,053	96.69	—18.44
Totals.....	\$114,965,514	\$1,462	81.36	-----	\$96,700,346	\$1,181	108.45	—19.22
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Del Norte.....	\$5,147,242	\$1,085	105.03	—49.79	\$5,187,945	\$1,348	96.01	24.24
Humboldt.....	46,969,513	1,025	99.23	—12.32	47,325,185	907	64.60	—11.51
Lake.....	8,618,745	1,068	103.39	—28	10,803,738	1,137	80.98	6.46
Mendocino.....	24,892,049	893	86.45	—15.20	26,072,679	848	60.40	—5.04
Totals.....	\$85,627,549	\$990	95.84	—16.17	\$89,389,547	\$928	66.10	—6.28

TABLE 122—Continued
 INDICES OF PURCHASING POWER FOR AREA 11
 Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Del Norte.....	1,850	.39	108.33	-----	1,872	.39	111.43	-----
Humboldt.....	15,481	.36	100.00	-----	15,275	.35	100.00	—2.78
Lake.....	3,303	.46	127.78	-----	3,580	.44	125.71	—4.35
Mendocino.....	7,714	.33	91.67	-----	8,069	.32	91.43	—3.03
Totals.....	28,348	.36	100.00	-----	28,796	.35	100.00	—2.78
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Del Norte.....	1,939	.41	103.00	5.13	1,636	.42	135.48	2.44
Humboldt.....	18,093	.39	98.00	11.43	16,860	.32	103.23	—17.95
Lake.....	3,960	.49	123.00	11.36	3,983	.42	135.48	—14.29
Mendocino.....	9,946	.36	90.00	12.50	9,197	.30	96.77	—16.67
Totals.....	33,938	.39	98.00	11.43	31,676	.33	106.45	—15.38

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Del Norte.....	\$2,058	\$434	76.68	-----	\$1,148	\$242	63.19	—44.24
Humboldt.....	22,965	531	93.82	-----	14,662	334	87.21	—37.10
Lake.....	2,446	341	60.25	-----	2,236	272	71.02	—20.23
Mendocino.....	9,203	392	69.26	-----	5,575	223	58.22	—43.11
Totals.....	\$36,672	\$466	82.33	-----	\$23,621	\$289	75.46	—37.98
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Del Norte.....	\$1,890	\$398	86.33	64.46	\$2,960	\$624	84.44	56.78
Humboldt.....	19,619	428	92.84	28.14	30,301	661	89.45	54.44
Lake.....	2,832	351	76.14	29.04	5,772	715	96.75	103.70
Mendocino.....	9,106	327	70.93	46.64	14,528	521	70.50	59.33
Totals.....	\$33,447	\$387	83.95	33.91	\$53,561	\$619	83.76	59.95

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Population

Having a total area of nearly 6 million acres and less than 100 thousand people the resulting population density is one person for every 63 acres. There are several reasons for the comparatively sparse settlement of these four counties but the principal cause has been

inadequate transportation into and out of the Area. With the development of better roads and the railroad, more opportunities for growth and expansion did occur but the percentage increase has not been in keeping with the rest of the State.

The following Table 123 shows the population growth of these four counties since 1930.

CALIFORNIA AIRPORTS

TABLE 123
POPULATION OF AREA 11 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930				1945			
Del Norte.....	4,739	.08		Del Norte.....	3,850	.04	-18.86
Humboldt.....	43,233	.76		Humboldt.....	52,200	.58	13.94
Lake.....	7,166	.13		Lake.....	9,500	.10	17.73
Mendocino.....	23,505	.42		Mendocino.....	30,750	.34	10.36
Total Area 11.....	78,643	1.39		Total Area 11.....	96,300	1.06	11.34
1935				1950			
Del Norte.....	4,750	.08	.23	Del Norte.....	4,150	.04	7.79
Humboldt.....	43,880	.72	1.50	Humboldt.....	52,600	.53	.77
Lake.....	8,225	.14	14.77	Lake.....	10,500	.11	10.52
Mendocino.....	25,010	.41	6.40	Mendocino.....	33,150	.33	7.80
Total Area 11.....	81,865	1.35	4.10	Total Area 11.....	100,400	1.01	4.25
1940				1955			
Del Norte.....	4,745	.07	-.11	Del Norte.....	4,350	.04	4.82
Humboldt.....	45,812	.66	4.40	Humboldt.....	55,650	.50	5.80
Lake.....	8,069	.12	-1.90	Lake.....	11,000	.10	4.76
Mendocino.....	27,864	.40	11.41	Mendocino.....	35,550	.32	7.24
Total Area 11.....	86,490	1.26	5.65	Total Area 11.....	106,550	.96	6.13

Source: Same as Table 93, Page 244.

TABLE 124
POPULATION STATISTICS OF AREA 11
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 11.....		55,994	65,729	69,690	78,643	86,490	†104,300	
Del Norte County.....		2,408	2,417	2,759	4,739	4,745	†6,200	
Crescent City.....	1854	699	1,114	955	1,720	1,363		
Humboldt County.....		27,104	33,857	37,413	43,233	45,812	†52,000	
Arcata.....	1858	952	1,121	1,486	1,709	1,855		
Blue Lake.....	1910		507	441	555	503		
*Eureka.....	1856	7,327	11,845	12,923	15,752	17,055		
Ferndale.....	1893	846	905	919	889	901		
Fortuna.....	1906		883	986	1,239	1,413		
Trinidad.....					107	94		
Lake County.....		6,017	5,526	5,402	7,166	8,069	†11,500	
Lakeport.....	1888	726	870	1,024	1,318	1,490		
Mendocino County.....		20,465	23,929	24,116	23,505	27,864	†34,600	
*Ft. Bragg.....	1889	1,590	2,408	2,616	3,022	3,235		
Point Arena.....	1908		497	394	385	374		
Potter Valley.....		563	576	512	Annexed to Ukiah Township			
*Ukiah.....	1876	1,850	2,136	2,305	3,124	3,731	4,726	Mar. 20, 1946
Willits.....	1888	791	1,153	1,468	1,424	1,625		

* URBAN—1940.

† Estimate of California Taxpayers' Association.

TABLE 124—Continued
POPULATION STATISTICS OF AREA 11
Unincorporated Places

	Popula- tion		Popula- tion
Del Norte County		Weott.....	175
Klamath.....	500	Wildwood.....	548
Requa.....	250	Willow Creek.....	150
Smith River.....	325		
Humboldt County		Lake County	
Alderpoint.....	150	Clearlake Highland.....	250
Alton.....	225	Clearlake Oaks.....	150
Bayside.....	500	Clearlake Park.....	150
Bayview.....	300	Kelseyville.....	300
Beatrice.....	125	Lower Lake.....	175
Bridgeville.....	300	Lucerne.....	125
Crannell.....	350	Middletown.....	450
Cutten.....	509	Nice.....	175
Falk.....	220	Upper Lake.....	709
Fieldbrook.....	100		
Fields Landing.....	150	Mendocino County	
Freshwater.....	150	Boonville.....	525
Garberville.....	400	Calpella.....	300
Harris.....	150	Caspar.....	565
Holmes.....	225	Comptche.....	125
Hoopa.....	150	Covelo.....	625
Hydesville.....	225	Elk.....	200
Korbel.....	300	Hopland.....	175
Loleta.....	375	Laytonville.....	125
Orick.....	275	Little River.....	150
Pepperwood.....	275	Mendocino.....	784
Rio Dell.....	350	Navarro.....	150
Rohnerville.....	450	Novo.....	100
Samoa.....	509	Philo.....	125
Scotia.....	1,085	Piercy.....	250
Shively.....	250	Potter Valley.....	595
South Fork.....	150	Talmage.....	350
Stumpville.....	250	Westport.....	200

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

The 1950 estimate for the entire Area (Table 63, Section 1, Part V) is 100,400 and the 1955 population is expected to reach 106,550, both figures representing about 1 percent of the State total. With the exceptions

of a very few localities, notably Eureka, Ukiah and Fort Bragg, the entire Area is rural in character, with most of the population concentrated along the main highways in small communities.

POPULATION, NUMBER OF FAMILIES AND AVERAGE FAMILY SIZE BY DECADES—1900-1940 *

County		1900	1910	1920	1930	1940
Del Norte.....	Population.....	2,408	2,417	2,759	4,739	4,745
	Families.....	601	572	793	1,408	1,567
	Average Size.....	4.01	4.22	3.48	3.36	3.03
Humboldt.....	Population.....	27,104	33,857	37,413	43,233	45,812
	Families.....	5,904	7,968	9,675	11,849	14,321
	Average Size.....	4.59	4.25	3.87	3.65	3.20
Lake.....	Population.....	6,017	5,526	5,402	7,166	8,069
	Families.....	1,465	1,533	1,582	2,315	2,728
	Average Size.....	4.11	3.60	3.41	3.10	2.96
Mendocino.....	Population.....	20,465	23,929	24,116	23,505	27,864
	Families.....	4,438	5,977	6,288	6,293	7,800
	Average Size.....	4.61	4.00	3.84	3.74	3.57
Area Total.....	Population.....	55,994	65,729	69,690	78,643	86,490
	Families.....	12,408	16,050	18,338	21,865	26,416
	Average Size.....	4.51	4.10	3.80	3.60	3.27

* Estimated Range for Population Growth in California to 1960—Reconstruction and Reemployment Commission, November, 1946.

AERONAUTICAL APPRAISAL

There are more existing airports in Area 11 than would normally be expected in a rugged and mountainous region, however, there has always been considerable citizen interest in the growth of aviation and the establishment of landing areas has, in several instances, preceded actual use by aircraft. This pro-

cedure is the exception rather than the rule because most airport sites were used by barnstorming pilots long before the actual airport was developed.

The airports in Area 11 are listed below with the existing class and ownership given for each airport; Plate M-11 shows the location of each facility in relation to the others in the Area.

<i>Plate M-11 Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
DEL NORTE COUNTY			
11- 1	Gasquet -----	U.S.F.S. Lease -----	S-2
11-25	Crescent City -----	County of Del Norte -----	4
HUMBOLDT COUNTY			
11- 5	Eureka-Arcata NAAS -----	U. S. Navy -----	5
11-30	Eureka -----	County of Humboldt -----	1
11-31	Eureka (NOLF-LTA) -----	City of Eureka -----	1
11-32	Fortuna-Rohnerville -----	County of Humboldt -----	1
11-33	Garberville -----	County of Humboldt -----	S-1
11-60	Orleans -----	Private -----	S-1
11-61	Scotia -----	Commercial-Private -----	S-1
MENDOCINO COUNTY			
11-40	Mendocino-Little River -----	County of Mendocino -----	4
11-41	Ukiah Municipal -----	City of Ukiah -----	3
11-42	Covelo-Round Valley -----	County of Mendocino -----	S-2
11-43	Willits Municipal -----	City of Willits -----	S-1
11-70	Fort Bragg-White -----	Commercial-Private -----	S-1
11-71	Laytonville-101 Ranch -----	Commercial-Private -----	S-1
LAKE COUNTY			
11-15	Gravelly Valley -----	U.S.F.S. -----	S-4
11-80	Lakeport-Lamson -----	Commercial-Private -----	S-2
11-81	Lower Lake-Seigler -----	Commercial-Private -----	S-2
11-82	Upper Lake -----	Private -----	S-1
11-83	Lower Lake-Austins -----	Private -----	S-1

Two airlines serve the north coastal counties with scheduled air transportation. United Air Lines directly connects Eureka with Oakland and San Francisco on the south, with a daily flight each way; one daily flight provides one-way service north from Eureka to Eugene, Oregon, and another one-way flight connects Medford, Oregon, with Eureka. Southwest Airways

inaugurated scheduled air service in January of 1947, giving feeder line service twice daily to Ukiah, Fort Bragg and Eureka to Medford, Oregon, on the north. The combined daily schedules of these two air carriers provide 28 flights to the three cities—12 for Eureka, 8 for Fort Bragg and 8 for Ukiah.

ESTIMATES FOR SCHEDULED TRAFFIC

As shown in Table 68, Section 2, Part V, the Area has an airline passenger potential as follows:

	1950	1955
<i>Passenger Potential</i>		
Crescent City -----	354	514
Eureka -----	4,951	6,677
Fort Bragg -----	1,414	1,541
Ukiah -----	2,475	3,595
Total Area 11 -----	9,194	12,327

Since the service recently inaugurated does not yet furnish a basis for estimating On and Off Passengers Per Trip, it is not possible to convert the above figures directly into required schedules.

As was shown in the section on Agriculture in this Area Treatment, about 26 tons of agricultural potential is likely to be shipped by air freight in 1950, and 508 tons in 1955. This estimate is based on recorded carload shipments from Mendocino County alone. Most of the potential is Lake County pears—shipped from Mendocino County due to lack of railway facilities in Lake County. This is considered a conservative estimate for in addition, dairy products, nursery stock, livestock and finished wood products may well be included as adaptable to air freight shipments. Improved methods of air transport make shipment of these commodities an economic possibility.

Following is a tabulation showing air freight potential of agricultural perishables for the Area (from Table 82, Section 4, Part V). This tabulation develops one potential DC-3 airplane load daily in 1950 and two in 1955. While these figures appear very nominal, it has been pointed out that they represent only perishable produce from the Area, and that other potential cargo shipments may be developed which will greatly

augment this figure. As an example the fishing industry of California's northern coast offers potential air cargo in both frozen and fresh sea food for the supply of markets throughout the State.

A large volume of the agricultural production of Area 11 is adaptable to air freight, and the following analysis of 1945 surface shipments furnishes estimates of future air transportation tonnage:

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Del Norte.....	None.....						
Humboldt.....	None.....						
Lake.....	None.....						
Mendocino.....	Grapes.....	151	2,567	1	25.7	5	128.4
	Pears.....	1,265	18,975	0		2	379.5
	Area Total.....	1,416	21,542		26		508

Source: * *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

† Average tons per carload and percentages likely to move by air at rates given from:
Larsen, S. A., *Air Cargo Potential in Fresh Fruits and Vegetables*, Wayne University Press, Detroit, Michigan, 1944.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

(From Table 82)

AREA 11

	Days in Normal Growing Season*	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total.....		26	10	1	2	
Del Norte.....						
Humboldt.....						
Lake.....						
Mendocino.....	208	26	10	.10	2	.02
1955 Total.....		508	203	2	44	1
Del Norte.....						
Humboldt.....						
Lake.....						
Mendocino.....	208	508	203	1.95	44	.42

Source: * Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

PRIVATE FLYING ESTIMATES

Based upon a combination of economic buying potential and current private plane per capita ownership, the anticipated private plane ownership for 1950 and 1955 in Area 11 is distributed as follows:

County	Index	Private Plane Ownership	
		1950	1955
Del Norte -----	49	4	9
Humboldt -----	66	67	147
Lake -----	69	13	31
Mendocino -----	55	36	75
Total -----		120	262

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in the Non-Scheduled Aviation Projection, Part V:

LAKE COUNTY			
Township	Pct.	1950	1955
1 -----	18.52	2	6
2 -----	17.61	2	5
3 -----	20.16	3	6
4 -----	25.71	3	8
5 -----	18.00	3	6

DEL NORTE COUNTY			
Township	Pct.	1950	1955
Crescent -----	77.80	3	7
Klamath -----	12.30	1	1
Smith River -----	9.90	-	1

HUMBOLDT COUNTY			
Township	Pct.	1950	1955
Eureka -----	53.82	36	79
Fortuna -----	8.56	6	13
Garberville -----	3.72	2	5
Klamath -----	1.61	1	2
Loleta -----	3.76	3	6
Mad River -----	1.26	1	2
Mattole -----	.50	-	1
Pacific -----	5.12	3	7
Scotia -----	6.82	5	10
Union -----	14.83	10	22

MENDOCINO COUNTY			
Township	Pct.	1950	1955
Anderson -----	2.49	1	2
Arena -----	3.82	1	3
Big River -----	4.91	2	4
Cuffeys Cove -----	.88	-	1
Little Lake -----	9.35	3	7
Long Valley -----	1.85	1	1
Round Valley -----	3.26	1	2
Sanel -----	3.46	1	3
Ten Mile River -----	21.12	8	16
Ukiah -----	48.86	18	36

AIRPORT REQUIREMENTS

DEL NORTE COUNTY

Gasquet

One of the State's northernmost communities, is located 13 miles east northeast of Crescent City, Del Norte County. The present Class Sub 2 airport is usable but requires landing area improvements, and service facilities, to increase utilization of the field during the rainy season. Del Norte County is a relatively isolated section of the State from a transportation standpoint. Travel to the County's recreational areas from other parts of the State is long and tedious. However, there were 53,000 visitors to its two State Parks in 1946. It is believed that air transportation offers particular advantages to this section in providing ease of travel to trading centers, development of tourist and recreation traffic, and forest protection. There are but two airports in the County—Gasquet and Crescent City, thirteen miles apart. The Federal and State Forestry Services have requested development of the Gasquet airport. For the above reasons, it is felt that development of this Class Sub-2 airport to a standard Class 2 facility by 1950 is very desirable.

Smith River

Smith River is located at the extreme northwestern corner of Del Norte County, in a particularly remote section of the State. It is recommended that consideration be given the establishment of a Class 1 airport at this location by 1950, principally to augment the trans-

portation facilities of the area. Travel to and from population and shopping centers is long and tedious by surface vehicles. An airport here would be of assistance to the Forest Services in fire patrol and suppression and establishment of a Class 1 facility is recommended by Federal and State Forestry Services. Further, there are many recreational tourist attractions which could be developed greatly once they were made more readily accessible to visitors from other parts of the State.

Requa

This community is located near the mouth of the Klamath River and would be expected to serve the airport needs of Klamath, approximately three miles up the River, as the latter community is a heavily wooded section unfavorable to airport development. The Klamath River here is one of the foremost salmon-fishing streams in California and attracts thousands of sportsmen yearly, of the type interested in the convenience and time-saving afforded by air transportation. An airport at Requa would prove of assistance in fire patrol and suppression and establishment of a Class 1 facility is recommended by Federal and State Forestry Services. Because of the non-scheduled activity—pleasure and business travel to population and shopping centers—to be served, in addition to the recreational and forestry service requirements mentioned the establishment by 1955 of a Class 1 airport is recommended in this locality.

HUMBOLDT COUNTY**Crescent City**

The present Del Norte County Airport, located 2½ miles northwest of Crescent City has good landing facilities, but no provision has been made for airport services—repair shops or storage facilities. Further service development is recommended for the airport, including an administration building. Southwest Airways now have an application pending to serve Crescent City on their Route 76 between Medford, Oregon, and Eureka.

Eureka

The City of Eureka is presently served with two Class 1 airports. One is county owned and located 3.6 miles east-northeast of the city; the other is a former Navy Lighter-Than-Air field two miles west of Eureka, being acquired by the city. Eureka has an estimated 19,000 residents of the estimated county total of 44,100, or nearly 48 percent of the total population. Reference to the Private Flying Estimates tabulation in this Area Treatment will show a 1955 potential airplane ownership for the Eureka Area of 79 locally owned and operated airplanes. To this number should be added a number of itinerant aircraft which might be reasonably expected to use the airport facility, and a total is indicated which would justify two Class 2 airports in the immediate vicinity of Eureka.

Fortuna-Rohnerville

Situated some 20 miles south of Eureka, the Fortuna-Rohnerville district has a population of over 2,000. Principal activity is in livestock and dairying. It is presently served by a Public Class 1 airport, well located and utilized by nonscheduled flying activities. The site is suitable for ultimate expansion to a Class 3 airport; however, the only justification for expansion of the facility to Air Carrier Standards is the advantageous location far enough from the coast to result in comparative freedom from coastal fogs. For this reason the site offers possibilities as an alternate feederline airport for the Eureka scheduled airline stop. The necessity for improving Fortuna to a higher classification than Class 2 (recommended for 1950) should be judged upon the ultimate dependability of service into Eureka under all-weather flying conditions. If it is found possible to maintain schedules into Eureka with the aid of the facilities offered at the Arcata airport, then it should not be necessary to provide an alternate airport at Fortuna, and a Class 2 at this location will adequately serve all nonscheduled demands, until 1955.

Garberville

The community of Garberville in the extreme south portion of Humboldt County is in a mountainous area which provides few opportunities for emergency landings, and inasmuch as it is on a direct air route which sees considerable air traffic between Eureka and San Francisco Bay Counties, a landing area large enough

for the majority of planes flying the route should be provided. Garberville is in the center of a famous resort and recreational area and the use of an airport in this section will be especially heavy during the summer months. Although the forestry services have indicated that they are presently satisfied to use this field in its present condition, it is recommended for the purposes of this study that the field be brought up to Class 2 standards by 1950.

Orleans

Orleans, a small community in the extreme northeastern corner of Humboldt County on the Klamath River, is the center of an isolated section of rugged and mountainous country. Surface travel is slow and wearisome, while airline distances are short—Orleans is fifty airline miles from Eureka and 60 airline miles from Yreka in Siskiyou County. An airport at this location is a valuable aid in patrol and fire suppression. Access to trading centers and recreational attractions in the Area, and development of tourist traffic, all hampered by the region's lack of convenient transportation, point up the desirability of adequate airport facilities. There is at present a Class Sub-2 private airport at Orleans. The United States Forest Service has recommended the development of a Class 2 airport at Orleans, in which recommendation this study concurs.

Hoopa

Hoopa is halfway between Willow Creek and Weitchpec and is the headquarters for the Hoopa Valley Indian Reservation, located in northeastern Humboldt County. It is relatively isolated from other parts of the county. Surface transportation to centers of population is slow and somewhat hazardous. A Class 1 airport at Hoopa would serve local needs for faster, more convenient transportation to and from the valley, as well as constituting an emergency field for itinerant aircraft flying between Siskiyou and Humboldt Counties via the Klamath River.

Orick

Forty-four miles north of Eureka, slightly inland from the coast, the community of Orick is about equidistant between Crescent City and Eureka. An airport in this northwestern section of Humboldt County would provide a facility for aircraft flying the coast route from Eureka into Oregon, and serve resident and resort population in and around this famous vacation and sports area. A Class 1 airport should be adequate for the period covered by this study but provision should be made to expand any proposed airport, since tourists and particularly residents of the valley sections of California, could readily overtax a small facility at Orick, especially during the summer months.

Scotia

A private substandard Class 2 airport provides a portion of needed facilities for the Scotia district, which

is located in southern Humboldt County some 28 miles south of Eureka on the U. S. 101 Highway. It is located on a direct air route between the San Francisco Bay Area, Eureka and points north. While the State Division of Forestry is currently satisfied with the installation for their purposes, it is the recommendation of this study that a Class 2 airport, by 1950, is necessary to adequately serve the nonscheduled and forestry requirements at this point.

LAKE COUNTY

Kelseyville

This community, located in Big Valley, is near the geographical center of Lake County's population, summer trade and the pear industry. Kelseyville is 83 airline miles north of San Francisco and 148 airline miles northwest of Sacramento. Many fine mountain resorts are located in this section. The community has a good airport site one mile northwest of the town. The Lake County Airport Plan recommends development of this site to a Class 3 or 4 airport to serve non-scheduled and potential cargo needs. Such a location might well serve as a feederline stop on established airways, and a weather and/or refueling stop for itinerant aircraft on flights between San Francisco and Eureka, and Sacramento to coast points.

Lower Lake

Lower Lake, Lake County, is a short distance inland from the south shores of Clear Lake, having a resident population of 1,700 but the heaviest summer population of any section of the County. The existing airport is well utilized, especially in the summer months when vacationists and tourists are visiting the Area. The Lake County Airport Plan recommends development of the present Sub 1 airport to a Class 2 facility to more adequately serve the local needs and to contribute to the healthy development of this isolated area.

Middletown

This community is in the southernmost portion of Lake County, relatively close to the boundaries of Napa and Sonoma Counties. The Lake County Airport Plan recommends that consideration be given to the location of an airport here to serve a recreational area presently difficult of access, and it would be the recommendation of this study that consideration be given the establishment of a Class 1 Airport by 1955.

Upper Lake

Location on the northern shores of Clear Lake, Lake County, the community's interests are principally farming, stock-raising, and in the summer months, the various services and needs of the vacationing tourist trade. There are no railway facilities in the County and the section is not readily accessible by surface vehicles since it is relatively remote from population centers. Air transportation would afford advantages of convenience and time saving in business and

pleasure travel to population and shopping centers. Further, an airport in the locality would assist the forestry services in fire patrol and suppression. For these reasons, as well as the material impetus to be given the community's tourist business, it is recommended that consideration be given to a Class 2 airport here by 1950. There is at present a Private Class Sub-2 airport at Upper Lake.

Lakeport

The city of Lakeport, in the far western portion of Lake County, and adjacent to Clear Lake is presently served by a Private Class Sub-2 airport which is well utilized. From the standpoint of servicing the transportation needs of the community, consideration for the development of a Class 2 airport by 1950, at Lakeport is recommended.

Several communities are served with facilities which, with minor improvements, could be termed adequate for the period under study. However, there are no airports in Area 11 that have received complete development and plans are in preparation which, when carried out, will provide the communities with airports which will materially contribute to their economic growth. The following paragraphs list communities where existing facilities are deemed inadequate or have no airport to serve present or anticipated needs.

MENDOCINO COUNTY

Ukiah

Ukiah is the principal city in Mendocino County and the county seat. It has a Class 3 airport one mile south of town, and is convenient to the Redwood Highway 101 which increases the utility of this field. Ukiah Airport is the center of aviation activity in Mendocino County; it is a scheduled stop for feeder line service and is an important intermediate point between San Francisco and Eureka. The city is planning an administration building and hangars, and the utilization of the field as a service stop for both surface and air travelers. The local school system plans to integrate its courses in aviation with the activities of the airport. Local desire is to extend the present runway to meet Class 4 requirements, thereby making it adequate for all civil aviation and commercial air service. When these plans have been accomplished the airport will approach maximum utilization.

Fort Bragg

The second most populous community in Mendocino County is Fort Bragg, located on the coast, with a population of 3,235. Nearby Noyo, at the mouth of the Noyo River, is the center of commercial fishing in the Area, having fish canning and drying plants. The Mendocino County Master Plan of Airports recommends the development of a Class 1 airport at Fort Bragg which could ultimately be expanded to Class 2 as traffic necessitated. However, for the purpose of this study, it is considered that the Class 4, 2.5 miles southeast of Little

River and 14 miles south of Fort Bragg provides adequately for air transport or cargo operations in this Area, and between this field and the present commercial airport at Fort Bragg, recommended for improvement to standard Class 1 by 1950, the non-scheduled needs of this community are satisfied for the duration of this program.

Willits

Willits, an incorporated town of 1,625 population is located north of Ukiah in the Little Lake Valley which has a population of nearly 3,000. The existing Class Sub-1 field is situated on the natural itinerant air route from San Francisco to Eureka. Improvements should be made to the landing area at an early date so that the field may be better utilized, especially during the rainy season. Both the U. S. Forest Service and the State Division of Forestry have a definite interest in an airport serving this section of Mendocino County; however a Class 2 field is necessary for the forestry services, and future fire suppression and patrol work may call for early expansion of the field to meet this requirement.

Point Arena

Located on the coast in southern Mendocino County, Point Arena is in the heart of a recreational area, access to which is difficult. In addition to the recreational need, Point Arena has been considered by the Civil Aeronautics Administration as a midpoint in the coast airway between San Francisco Bay and Eureka, requiring emergency landing facilities. The locality, approximately thirty miles south of Little River, is otherwise without suitable airport accommodations. A Class 1 airport by 1950 is recommended.

Boonville

This community is located inland about half-way between Point Arena and Ukiah. Boonville residents and the residents of the surrounding section are principally farmers, stock raisers and lumber workers. Situated in mountainous terrain, this part of Mendocino County is not easily accessible, and the airplane could effect material time-saving in travel to trading centers in Ukiah or San Francisco. There are many recreational opportunities, especially hunting and fishing. Further, the State Division of Forestry has indicated their need for an airport in this locality. Development of a Class 1 airport is recommended for 1950.

Covelo

Covelo is located in Round Valley in the north-eastern portion of Mendocino County. County roads are the only present means of ingress and egress since there are no highways serving the section. Local residents have long been mindful of the advantages of air

travel since transportation by other means in this area is long and tedious. The community is forty-five airline miles and sixty-seven road miles north of Ukiah, and 60 airline miles and 86 road miles northwest of Willows. Covelo is the only town in Round Valley, the largest valley in the County, and is the headquarters for the Round Valley Indian Reservation. Sportsmen find fish and game in abundance in nearby streams and mountains. Consideration should be given to the relocation of the Covelo airport to secure more favorable terrain clearances, although both Federal and State Forestry Services appear satisfied for the time being with present facilities. In addition to its value to local residents and the forestry services, the Covelo location affords a much needed emergency facility in an otherwise hazardous flying terrain.

Mendocino (Little River)

The Mendocino-Little River community, located on the coast of Mendocino County, fourteen miles south of Fort Bragg and thirty-one miles northwest of Ukiah, has a Class 4 airport. The runway should be lighted at an early date and suitable housing, access roads and other improvements provided. Construction of the airport was originally justified in the interests of National Defense, but it now serves as an important feeder line stop for Southwest Airways, providing air transport service to Mendocino and Fort Bragg. Acceptance of this new service in this rather isolated community has exceeded all expectations and the continued usefulness of this airport in civil aviation is assured. Since most of the freight that is shipped into Fort Bragg and the surrounding area is handled by trucks travelling over mountainous roads, it is reasonable to assume that much of the fresh sea food and garden produce could be moved advantageously to outside markets by air. The airport will also serve as an intermediate field on an alternate coastline air route.

Laytonville

This community is one of the smallest in Mendocino County having need for an airport. Laytonville is located in Ten Mile Valley on Redwood Highway No. 101, 86 airline miles south-southeast of Eureka and 146 airline miles north-northwest of San Francisco, on a direct line of flight for the scheduled air service between those two cities. Although the State Division of Forestry appears currently satisfied to use the facility in its present condition, this Class Sub 1 airport should be brought to Class 1 standards by 1950 to serve the famous recreational area, the Redwood Empire embracing several of the well-known State parks of this region. Accessibility to the area through the airport facility may well prove beneficial in cases of emergency not necessarily aeronautical in character.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 11

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Del Norte County							
Gasquet.....	Gasquet.....	USFS.....	S-2	2	R,FS,NS		
Smith River.....				1	R,FS,NS		
Requa.....				1	R,FS,NS		
Del Norte State Park.....						1	R,FS,NS
Humboldt County							
Eureka.....	Eureka.....	County.....	1	2	R,FS,NS		
Eureka.....	Eureka (NOLF-LTA).....	Municipal.....	1	2	R,FS,NS		
Fortuna.....	Fortuna-Rhonerville.....	County.....	1	2	R,FS,NS		
Garberville.....	Garberville.....	County.....	S-1	2	R,FS,NS		
Orleans.....	Orleans.....	Private.....	(S-1)	2	R,FS,NS		
Hoopa.....				1	NS		
Orick.....				1	R,FS,NS		
Scotia.....	Scotia.....	Private.....	S-2	2	FS,NS		
Redwood Creek (equidistant between Hoopa and Orick).....						1	R,FS,NS
Korbel (10 mi. S.E.).....						1	R,FS,NS
Kneeland.....						1	R,FS,NS
Mad River, (4 mi. N. E. of Showers Pass).....						1	R,FS,NS
Larrabee Creek, (10 mi. N. of Eel Rock).....						1	FS,NS
Petrolia.....						1	FS,NS
Ettersburg.....						1	FS,NS
Ft. Seward.....						1	FS,NS
Lake County							
Kelseyville.....				3	FP,CP,R,NS		
Lower Lake.....	Seigler.....	Private.....	S-2	2	R,NS		
Middletown.....						1	R,NS
Upper Lake.....		Private.....	(S-1)	2	R,FS,NS		
Lakeport.....	Lamson.....	Private.....	S-2	2	NS		
Reiff, (at Junction of Yolo, Napa and Lake Counties).....						1	FS,NS
Clearlake Oaks.....						1	FS,NS
Bartlett Springs (8 mi. E.).....						1	FS
Mendocino County							
Ukiah.....	Ukiah.....	Municipal.....	3	4	FE,R,FS,NS		
Ft. Bragg.....	White.....	Private.....	S-1	1	R,NS		
Willits.....	Willits.....	Municipal.....	S-1	1	R,FS,NS	2	R,FS,NS
Point Arena.....				1	R,FS,NS		
Boonville.....				1	R,FS,NS		
Covelo.....	Round Valley.....	County.....	S-2	2	R,FS,NS		
Laytonville.....	101 Ranch.....	Private.....	S-1	1	R,FS,NS		
Usal Creek.....						1	FS
Eden Creek.....						1	FS
Comptche.....						1	FS

* Unless otherwise noted, no additional development required
by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not
included in civil airport count.

APPENDIX 12

AREA 12—CHICO-RED BLUFF

DESCRIPTION OF AREA

Comprised of four northern counties in the upper Sacramento Valley, Area Twelve encompasses the whole of Butte, Colusa, Glenn and Tehama counties. In general this area is the upper half of the Sacramento Valley and extends from the Sierra Nevada on the east to the Coast Range on the west with a large expanse of rich and productive land in the middle.

The topography of Area Twelve conforms to the general pattern throughout the Sacramento and San Joaquin Valleys with the exception that water development on arable land has not been as extensive here as in the more populated areas. To the east of the fertile river bottoms the valley floor slopes first to table-lands

and then to the more rugged Sierra Nevada; on the west the slope is to rolling foothills and the mountains of the Coast Range. The Sacramento River bisects the area into eastern and western sections; many rivers and streams, some of which dry up during the summer, supplement the natural water supply. Climate in the valley portions is typical of the entire Central Valleys—hot dry summers followed by a rainy season from November through March or April; the higher elevations in all four counties have snowfall during the winter months. Climatic data is shown in the table below with the cities listed being representative of the various sections in the area.

Station	Station elevation	Average rainfall (inches)	Temperature degrees F.			
			Monthly averages of daily extremes			
			January	High	Low	July
Chico	189	23.86	36.0	53.7	59.9	98.3
Las Plumas	506	44.49	38.0	38.0	59.7	99.4
Colusa	60	15.78	37.6	53.0	60.1	95.0
East Park	1,205	17.39	31.4	54.6	57.3	96.9
Willows	136	16.44	36.1	53.4	61.1	97.0
Orland	254	17.64	36.8	53.2	63.0	99.8
Red Bluff	341	23.38	37.5	53.2	66.0	97.0
Mineral	4,905	45.41	21.7	39.0	44.0	84.4

Source: United States Weather Bureau, United States Department of Commerce.

Area twelve consists of over 4 and one-half million acres and the following table shows a general breakdown of the land usage. (From Table 15)

Usage	Acres	Percent of Total
Total area	4,549,760	100.
Total privately owned	3,488,737	76.68
Land in farms	2,906,689	
Forest and other	582,048	
Total publicly owned	1,061,023	23.32
National Forest—Parks	713,771	
Other public lands	347,252	

Several excellent scenic and recreational attractions are present in the rugged eastern section of this Area. The south entrance to Lassen Volcanic National Park, which saw 108,663 visitors in 1941, is the locale for some limited but very fine tourist accommodations and in

the southern portion of Area 12 is found the famous Feather River Canyon, Feather Falls and Bald Rock. The 640 foot drop of Feather Falls is exceeded in California only by those in Yosemite National Park. Bald Rock is a single granite stone which rises sheer 3,600 feet from a canyon so rough that it is very difficult to traverse.

In the 2,400 acre Bidwell Park in Chico, Butte County, grows the Sir Joseph Hooker Oak, largest living white oak tree in the world. Another park in the same vicinity, the Bidwell State Park, registered 15,000 visitors during the 1946 season. Many sections of this area offer good hunting and fishing to the sportsman. Deer and other game abound in the higher elevations and the valley areas attract duck and pheasant hunters for hundreds of miles.

ECONOMIC FACTORS

Resources

The 1930-1945 average mineral production for the counties of Butte, Colusa, Glenn and Tehama amounted to an annual value of \$1,397,875 or only .41 percent of the State total; however, the production of lumber makes a greater contribution to the Area's economy inasmuch as large stands of timber exist in the eastern and northwestern sections. In 1945 there were

109,121,000 board feet of lumber produced in Area 12, 4.83 percent of the State total. There yet remains an estimated 11,720,120,000 board feet of merchantable timber in the four counties, the largest stand being in Tehama.

Several potential sites for hydro electric power development exist in the Area with most of the available locations lying in the eastern section of Tehama and Butte Counties along the western slopes of the

Sierra Nevadas. With continued development of the State Water Plan and the Central Valley Project, much can be expected from the part water will play in the economic development of this north portion of the Sacramento Valley.

Industry

Because most of the Area is utilized for agricultural purposes it is the leading basic industry. The production of food products is the most important, with fruit and olive canneries, dairy products plants, rice mills, sugar refineries, flour and grain mills, wineries, bakeries and a brewery operating in the Area.

Other than Butte County, which has always been among the leading producers of gold, relatively little mining is done in Area 12. Commercial mineral production is made up primarily of stone, sand and gravel, chromite, zinc, manganese and natural gas; although occasional deposits of other minerals are in existence their commercial production has never made a large contribution to the economy of the Area.

The lumbering industry, already important in Butte County, shows little development in Glenn and Tehama Counties in spite of their high potential. Commercial timber available in these two Counties totals 7,750,000,000 board feet, yet 1945 lumber production was less than 15,000,000 board feet or .2 percent of the supply. As present sources of timber become less able to meet demands, early intensive exploitation of these resources is anticipated. Such development would contribute materially to the Area's economic welfare but would also create a need for better transportation. Well located and adequate airports will not only assist in providing necessary transportation facilities but will aid the Forestry Services in protecting this great resource. Listed below are airport facilities required by the Forestry Services:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 12 by Counties

Butte County

The State Division of Forestry will use Chico Municipal and Oroville Airports in their present condition. The United States Forest Service will also use Chico Municipal Airport in its present condition.

Colusa County

1. Class 2 at Stonyford—United States Forest Service.

Glenn County

The United States Forest Service will use Willows Airport in its present condition.

Tehama County

1. Class 2 at Mineral—United States Forest Service.
 2. Class 1 at Paskenta—State Division of Forestry.
 3. Class 1 at Corning—State Division of Forestry.
- The State Division of Forestry and the United States Forest Service will use Red Bluff Airport in its present condition.

Although there is considerable commercial activity in Area 12 most of the exportation is basic agricultural products and lumber, neither of which are very adaptable to air freight. Nearly all exports are to Sacramento and the San Francisco Bay cities and it is from these areas that a considerable portion of their imports is received.

Agriculture

A large part of the valley section of Area 12 is devoted to farming and agricultural uses although only a small portion is under irrigation. Much of this arable acreage lies above present canals but could be irrigated by further development of the existing water supply. Certain proposed water development projects would greatly increase the productivity of the Area and this inevitable expansion should be given careful consideration in the airport programs of Area 12.

In the Table below, is listed carlot shipments made from Area 12 during 1945:

NUMBER OF OUTBOUND CARLOADS IN 1945

Commodity	Butte	Colusa	Glenn	Tehama
Apples (Dried).....	5			
Apricots.....	4			
Lemons.....			5	
Mixed Melons.....	3			
Oranges and Satsumas.....	63		158	
Peaches.....	45			85
Peaches (Dried).....	10			6
Peas.....	45			
Persian Melons.....	27			
Plums and Fresh Prunes.....	1			
Prunes (Dried).....	191	206	67	29
Watermelons.....	121			
Totals.....	515	206	230	120
Grand Total.....				1,071

Source: *California Carlot Shipments, Fruits and Vegetables, 1945*, California Crop and Livestock Reporting Service and Federal-State Market News Service.

The agricultural production of these four counties shows a diversity of products with field crops, livestock and livestock products, and fruits and nuts contributing about equally to the Area's economy. Butte County is the top-ranking rice and almond producer in the State and Tehama County ranks first in the production of wool and among the first in lambs and beef. Other important commodities produced in this Area are olives, hogs, butterfat, peaches, barley, prunes, walnuts, alfalfa, oranges, sugar beets, poultry, and turkeys. The gross cash farm income rose from 26 million dollars in 1940 to more than 61 million dollars in 1945, an increase of 137 percent. The following tabulation reveals the value by County:

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	Percent change 1940 to 1945
United States.....	\$8,343,000	-----	100.00	\$20,780,900	-----	100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Butte.....	8,300	1.23	.10	21,263	1.19	.10	160.51
Colusa.....	5,500	.82	.07	13,187	.74	.07	139.76
Glenn.....	6,800	1.01	.08	15,027	.84	.07	120.98
Tehama.....	5,300	.79	.06	11,960	.67	.06	125.66
Total Area 12.....	25,900	3.85	.31	61,437	3.44	.30	137.21

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States, 1946*.

Indices of Purchasing Power

The average assessed valuation of the four county total assessments for the years 1930-35-40 and 45 was \$114,184,448 which represented an average per capita value of \$1,493 which is well above the State average

of \$1,331 for the same period. The average inside tax rate of \$1.457 and an average outside tax rate of \$1.67 raised \$3,375,487 for the fiscal year 1944-45.

The following Table 125 gives several indices of purchasing power, indicating the constant growth in per capita wealth in comparison with the State average.

TABLE 125

INDICES OF PURCHASING POWER FOR AREA 12

Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944

(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Butte.....	\$13,906	.33	\$19,398	.35	\$26,447	.37	\$34,199	.40
Colusa.....	4,472	.11	6,172	.11	8,945	.12	11,605	.13
Glenn.....	3,556	.08	4,909	.09	7,136	.10	9,003	.10
Tehama.....	4,895	.11	6,122	.11	8,448	.12	10,622	.13
Totals.....	\$26,829	.63	\$36,601	.66	\$50,976	.71	\$65,429	.76

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Percent Change, 1940 to 1945
Butte.....	\$23,966	\$559	69.61	\$45,853	\$916	66.67	63.86
Colusa.....	6,976	713	88.79	15,344	1,582	115.14	121.88
Glenn.....	7,525	617	76.84	16,500	1,162	84.57	88.33
Tehama.....	7,600	531	66.13	15,592	1,016	73.94	91.34
Totals.....	\$46,067	\$582	72.49	\$93,289	\$1,045	76.06	79.55

CALIFORNIA AIRPORTS

TABLE 125—Continued
 INDICES OF PURCHASING POWER FOR AREA 12
 Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Butte.....	\$47,642,592	\$1,397	77.74	-----	\$45,723,920	\$1,254	115.15	—10.24
Colusa.....	27,704,371	2,701	150.31	-----	21,146,805	2,167	198.99	—19.77
Glenn.....	28,549,717	2,611	145.30	-----	20,325,515	1,825	167.58	—30.10
Tehama.....	23,188,265	1,672	93.04	-----	17,469,025	1,243	114.14	—25.66
Totals.....	\$127,084,945	\$1,838	102.28	-----	\$104,665,265	\$1,465	134.53	—20.29
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Butte.....	\$44,719,897	\$1,044	101.06	—16.75	\$50,694,075	\$1,013	72.15	—2.97
Colusa.....	19,954,930	2,039	197.39	—5.91	24,465,870	2,522	179.63	23.69
Glenn.....	20,242,950	1,660	160.70	—9.04	23,218,480	1,635	116.45	—1.61
Tehama.....	19,716,510	1,377	133.30	10.78	21,974,872	1,432	101.99	3.99
Totals.....	\$104,634,287	\$1,322	127.98	—9.76	\$120,353,297	\$1,348	96.01	1.97

Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Butte.....	14,266	.42	116.67	-----	15,332	.42	120.00	-----
Colusa.....	4,553	.44	122.22	-----	4,677	.48	137.14	9.09
Glenn.....	4,967	.45	125.00	-----	5,154	.46	131.43	2.22
Tehama.....	5,339	.39	108.33	-----	5,705	.41	117.14	5.13
Totals.....	29,125	.42	116.67	-----	30,868	.43	122.86	2.38
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Butte.....	18,934	.44	110.00	4.76	17,760	.35	112.90	—20.46
Colusa.....	4,758	.49	123.00	2.08	4,237	.44	141.94	—10.21
Glenn.....	5,541	.45	113.00	—2.17	5,118	.36	116.13	—20.00
Tehama.....	6,092	.43	108.00	4.88	5,570	.36	116.13	—16.28
Totals.....	35,325	.45	113.00	4.65	32,685	.37	119.35	—17.78

TABLE 125—Continued
 INDICES OF PURCHASING POWER POR AREA 12
 Per Capita Retail Sales^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Butte.....	\$16,211	\$475	83.92	-----	\$13,279	\$364	95.04	—23.37
Colusa.....	5,616	547	96.64	-----	4,157	426	111.23	—22.12
Glenn.....	5,463	500	88.34	-----	4,094	368	96.08	—26.40
Tehama.....	6,214	448	79.15	-----	4,639	330	86.16	—26.34
Totals.....	\$33,504	\$484	85.51	-----	\$26,169	\$366	95.56	—24.38
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Butte.....	\$18,588	\$434	94.14	19.23	\$30,121	\$703	95.13	61.98
Colusa.....	4,114	420	91.11	—1.41	5,919	605	81.87	44.05
Glenn.....	4,964	407	88.29	10.59	7,476	613	82.95	50.61
Tehama.....	5,900	412	89.37	24.85	8,377	585	79.16	41.99
Totals.....	\$33,566	\$424	91.97	15.85	\$51,893	\$656	88.77	54.72

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

Transportation

The Area is fairly well served with surface transportation facilities. U.S. Highways 99E and 99W traverse the four counties from North to South on the eastern and western sides of the valley floor, merging at Red Bluff into U.S. Highway 99. State Routes 20, 45 and 32 connect 99E with 99W at various points while State Routes 36 and 20 cut across the north and south portions respectively, from East to West. State Route 32 provides an outlet to the Northeast of Chico and State Route 24 parallels the famous Feather River. It should be noted that there is only one road, unimproved, between Red Bluff and Williams which gives egress direct to the coastal area. While the distances by air are not great the surface miles, for residents in Area 12 desiring to travel to the coast, are excessive. In this respect air transportation offers tremendous advantages over ordinary methods of travel and provides an added stimulus for suitable airport facilities between this Area and the north coast counties.

The Southern Pacific main line, the Shasta Route, parallels Highway 99W and a branch goes up the east side to connect at Gerber in Tehama County. Another short branch line connects Fruto with Williams, both in Glenn County. The main line of the Western Pacific follows the Feather River Canyon.

Population

More than one-half of the population is concentrated in Butte County in the southeastern corner of

Area 12 and it is here that 47 of the 91 manufacturing plants as well as 2,851 of the Area's 5,455 farms are located. The average sized farm for the Area as a whole is 353 acres whereas the size is somewhat smaller in the southeastern section with but 240 acres per farm. As more land is brought under irrigation and as industry expands, particularly lumber and the wood using industries, the population will increase in direct proportion. The following tabulation shows the population growth since 1900 for the counties of:

	1900 ^b	1910 ^b	1920 ^b	1930	1940
Butte					
Population	19,117	27,301 ^a	30,030	34,093	42,840
Families --	4,139	6,397	7,917	10,047	13,414
Av. Size --	4.14	4.27	3.79	3.39	3.19
Colusa					
Population	7,364	7,732	9,290	10,258	9,788
Families --	1,544	1,763	2,362	2,668	2,911
Av. Size --	4.77	4.39	3.93	3.84	3.36
Glenn					
Population	5,150	7,172 ^a	11,853	10,935	12,195
Families --	1,014	1,530	2,952	3,095	3,527
Av. Size --	5.08	4.69	4.02	3.53	3.46
Tehama					
Population	10,997	11,401	12,882	13,866	14,316
Families --	2,363	2,697	3,585	4,018	4,176
Av. Size --	4.65	4.23	3.59	3.45	3.20
Area Totals					
Population	42,628	53,606	64,055	69,152	79,139
Families --	9,060	12,387	16,816	19,828	24,028
Av. Size --	4.66	4.39	3.83	3.55	3.30

^a Part of Glenn County annexed to Butte County in 1915.

^b Technical staff of the State Reconstruction and Reemployment Commission.

Source: California State Chamber of Commerce.

Table 126 includes the estimated population for 1950 and 1955. Table 127 more specifically indicates the

growth of incorporated and unincorporated cities and towns.

TABLE 126
POPULATION OF AREA 12 BY FIVE-YEAR PERIODS
1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930				1945			
Butte.....	34,093	.60		Butte.....	50,050	.55	16.83
Colusa.....	10,258	.18		Colusa.....	9,700	.11	— .90
Glenn.....	10,935	.19		Glenn.....	14,200	.15	16.44
Tehama.....	13,866	.25		Tehama.....	15,350	.17	7.22
Total Area 12.....	69,152	1.22		Total Area 12.....	89,300	.98	12.84
1935				1950			
Butte.....	36,475	.60	6.99	Butte.....	58,000	.58	15.88
Colusa.....	9,760	.16	—4.86	Colusa.....	10,550	.11	8.76
Glenn.....	11,140	.18	1.87	Glenn.....	17,000	.17	19.72
Tehama.....	14,050	.23	1.33	Tehama.....	16,500	.17	7.49
Total Area 12.....	71,425	1.17	3.29	Total Area 12.....	102,050	1.03	14.27
1940				1955			
Butte.....	42,840	.62	17.45	Butte.....	66,250	.60	14.22
Colusa.....	9,788	.14	.29	Colusa.....	11,400	.10	8.06
Glenn.....	12,195	.18	9.47	Glenn.....	19,375	.17	13.97
Tehama.....	14,316	.21	1.89	Tehama.....	18,875	.17	14.39
Total Area 12.....	79,139	1.15	10.80	Total Area 12.....	115,900	1.04	13.57

Source: Same as Table 93, Page 244.

TABLE 127
POPULATION STATISTICS OF AREA 12
Incorporated Places

Aviation Area, Counties and Cities	Date Incorporated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 12.....		40,627	53,606	64,055	69,152	79,139	†97,500	
Butte County.....		17,117	27,301	*30,030	34,093	42,840	†54,100	
Biggs.....	1903		403	683	463	547		
*Chico.....	c.c.	2,640	3,750	9,339	7,961	9,287		
Gridley.....	1905		987	1,636	1,941	2,338		
*Oroville.....	1857		3,859	3,340	3,698	4,421		
Colusa County.....		7,364	7,732	9,290	10,258	9,788	†10,200	
Colusa.....	1870	1,441	1,582	1,846	2,116	2,285		
Williams.....	1920				851	814		
Glenn County.....		5,150	7,172	*11,853	10,935	12,195	†15,600	
Orland.....	1909		836	1,582	1,195	1,366	1,700	July 1, 1946
Willows.....	1886	893	1,139	2,190	2,024	2,215		
Tehama County.....		10,996	11,401	12,882	13,866	14,316	†17,600	
Corning.....	1907		972	1,449	1,377	1,472		
*Red Bluff.....	1876	2,750	3,530	3,104	3,517	3,824		
Tehama.....	1906		221	196	190	175		

* URBAN—1940.

† Estimate of California Taxpayers' Association.

* Part of Glenn County, annexed to Butte County in 1915.

TABLE 127—Continued
POPULATION STATISTICS OF AREA 12
Unincorporated Places

	Population		Population
Butte County		Colusa County	
Bangor.....	200	Arbuckle.....	624
Cherokee.....	250	College City.....	175
Clipper Mills.....	150	Grimes.....	175
Coutolene.....	250	Maxwell.....	543
De Sabla.....	150	Princeton.....	275
Durham.....	1,550	Stonyford.....	150
Feather Falls.....	125		
Forbestown.....	200	Glenn County	
Honcut.....	175	Artois.....	125
Magalia.....	100	Butte City.....	250
Mulberry.....	855	Elk Creek.....	120
Nelson.....	200	Glenn.....	125
Palermo.....	350	Hamilton City.....	703
Paradise.....	2,859		
Richardson Springs.....	100	Tehama County	
Richvale.....	125	Gerber.....	508
Rio Bonito.....	125	Las Flores.....	100
Stirling City.....	450	Los Molinos.....	225
Thermalito.....	1,295	Richfield.....	325
Wyandotte.....	100	Vina.....	325
Yankee Hill.....	100		

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

Area 12 is served by two airlines. United Air Lines schedules two flights daily to Red Bluff between San Francisco and Klamath Falls, Oregon. Southwest Airways also operates two flights daily between San Francisco and Medford, Oregon, making stops at Chico and Red Bluff; an additional intermediate stop is now proposed for Oroville, where a Class 5 facility already

exists. If approval is granted by the Civil Aeronautics Board, the Area would be further benefited. Both airlines operate DC-3 type aircraft, carry passengers and freight and have a mail franchise.

Listed below are the airports of Area 12 by class and ownership:

Plate M-12 Map Code	City and Airport Name	Ownership	Class
TEHAMA COUNTY			
12-1	Campbell—Chico Aux.	U. S. W. A. A.	2
12-2	Vina—Chico Aux.	U. S. W. A. A.	2
12-3	Kirkwood—Chico Aux.	U. S. W. A. A.	2
12-25	Red Bluff Municipal	City of Red Bluff	3
12-50	Corning—Woodson	Commercial—Private	S-2
12-51	Mineral	Private	S-1
BUTTE COUNTY			
12-30	Chico Municipal (AAFld.)	City of Chico	6
12-31	Oroville Municipal (AAFld.)	City of Oroville	5
12-60	Chico—Ranchaero	Commercial—Private	1
12-61	Chico—Patrick	Commercial—Private	S-2
12-62	Gridley	Commercial—Private	S-2
12-63	Honcut	Private	1
GLENN COUNTY			
12-35	Orland—Chico Aux.	County of Glenn	2
12-36	Willows—Glenn County	County of Glenn	4
12-70	Artois .....	.....	-
12-71	Elk Creek	Private	S-1
COLUSA COUNTY			
12-16	Williams—CAA Site 9	CAA	S-3
12-80	Arbuckle—Vawters	Private	S-1
12-81	Colusa—Falcon	Commercial—Private	S-2
12-82	Williams—Dalton	Commercial—Private	S-2

ESTIMATES OF SCHEDULED AIR TRAFFIC

Estimated passenger potential was developed by apportioning the projected 1950 California passenger movements to the population within 25 mile radii of Chico and Red Bluff. The table shown below points out that Area 12 may anticipate a commercial air passenger load of 15,558 in 1950 and 22,598 in 1955.

All communities served, including the projected stop at Oroville, are located in the agricultural producing region and present the following commodities for air-freight candidates. Estimates are based on volume of carlot shipments made in 1945:

Airplane Stop	1950	1955
Chico	12,376	17,976
Red Bluff	3,182	4,622
	15,558	22,598

County	Commodity	1945		1950		1955	
		Carloads*	Tons	Percent @ 7¢†	Tons	Percent @ 5¢†	Tons
Butte.....	Apricots.....	4	60	2	1.2	8	4.8
	Honeydew Melons.....	57	627	0		2	12.5
	Mixed Melons.....	3	33	0		2	.7
	Peaches.....	45	540	7	37.8	23	124.2
	Pears.....	45	675	0		2	13.5
	Persian Melons.....	27	237	0		2	5.9
	Plums and Fresh Prunes.....	1	15	1	.2	13	2.0
	Total.....	182	2,247		39.0		164.0
Colusa.....	None						
Glenn.....	None						
Tehama.....	Peaches.....	85	1,020	7	71.4	23	234.6
	Total.....	85	1,020		71.0		235.0
Area Total.....		267	3,267		110.0		399.0

The above totals were reduced to actual daily air transport schedules with the following result:

The average between projected DC-3 and DC-4 schedules amounts to only one air freight flight daily

in 1950 and also 1955. Obviously, present commercial facilities will prove adequate to handle any anticipated cargo increase for the duration of this period under study.

AIR FREIGHT POTENTIAL OF AGRICULTURAL PERISHABLES

	Days in Normal Growing Season	Perishables Likely Air Freight Candidates (in tons)	Number of DC-3 Airplane Loads @ 5,000 lbs.	Schedules per Day ½ Growing Season	Number of DC-4 Airplane Loads @ 22,700 lbs.	Schedules per Day ½ Growing Season
1950 Total.....		110	44	1	10	
Butte.....	234	39	16	.14	4	.03
Colusa.....						
Glenn.....						
Tehama.....	274	71	28	.20	6	.04
1955 Total.....		399	160	1	35	1
Butte.....	234	164	66	.56	14	.12
Colusa.....						
Glenn.....						
Tehama.....	274	235	94	.69	21	.15

Source: Days in normal growing season from *Economic Survey of California, 1946*, Research Department, California State Chamber of Commerce.

PRIVATE FLYING ESTIMATES

Based upon a combination of economic buying potential and current private plane per capita ownership, the anticipated private plane ownership for 1950 and 1955 in Area 12 will be distributed as follows:

County	Index	Private plane ownership	
		1950	1955
Butte -----	103	115	271
Colusa -----	283	57	129
Glenn -----	176	57	137
Tehama -----	195	63	147
Total -----		292	684

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in Part V.

BUTTE COUNTY

Township	Pct.	1950	1955
Biggs -----	3.72	4	10
Chico -----	50.49	58	137
Durham -----	2.88	3	8
Gridley -----	11.17	13	30
KimsheW -----	5.25	6	14
Oroville -----	26.49	31	72

COLUSA COUNTY

Township	Pct.	1950	1955
Colusa -----	58.64	33	76
Williams -----	41.36	24	53

GLENN COUNTY

Township	Pct.	1950	1955
1 -----	8.38	5	12
2 -----	34.88	20	48
3 -----	1.88	1	3
4 -----	47.48	27	65
5 -----	4.55	3	6
6 -----	.14	--	--
7 -----	2.44	1	3
8 -----	.25	--	--

TEHAMA COUNTY

Township	Pct.	1950	1955
Corning -----	35.44	22	52
Red Bluff -----	64.56	41	95

BUTTE COUNTY

The service areas of the Cities of Chico and Oroville, approximately 20 airline miles apart, are considered adequately covered for the duration of this program, as a result of the acquisition by these cities of war surplus army air fields—City of Chico—Chico Army Air Field, a Class 6 facility five miles north of Chico, and City of Oroville—Oroville Army Air Field, a Class 5 facility approximately three and one-half miles west southwest of Oroville. Therefore, no recommendation is made for development of the two private airports adjacent to Chico, for the period under study.

Gridley

Gridley is recommended for a Class 2 development by 1950. The existing Class substandard 2 airport is

adequate for present needs, but the acreage is privately owned farm land, and the property may be put to other than airport use at any time. The community of Biggs, four miles north, has indicated a desire to acquire and develop an airport jointly with Gridley. The two towns serve a population of 9,000, with a 1955 private ownership potential of 40 aircraft.

Butte Meadows

The northeastern section of Butte County is extremely isolated and a Class 1 facility is recommended in the vicinity of Butte Meadows by 1955. This community is approximately 30 air miles from the nearest facilities at Chico on the south, Quincy on the east, Mineral to the north and Red Bluff on the west. Such a facility would serve as an emergency field for itinerant aircraft since no other suitable emergency airports exist within a radius of 30 miles. It would also serve the needs of the 14 private airplane potential ownership for KimsheW Township in 1955, in addition to providing a safety factor for east-west air traffic.

COLUSA COUNTY

Colusa

Recommendation is made that the present Class Sub-2 facility at Colusa be improved to a full Class 2 by 1955. The airport is conveniently located adjacent to the city, serving Colusa Township which has a potential private plane ownership of 33 by 1950 and 76 in 1955. This facility also assists in serving the airport needs of northwestern Sutter County. With the accomplishment of this recommended development the needs of the section should be adequately served to 1955.

Stonyford

A new Class 1 development is recommended for the vicinity of Stonyford where none now exists. This would also serve the town of Lodoga, as well as the southwestern part of Glenn County. In close proximity is Stony Gorge reservoir, suitable for boating and fishing and the area to the west affords recreation and hunting to several thousand visitors each year. The U. S. Forest Service has requested location of an airport here to serve their needs.

Williams

The City of Williams is presently served by two airports, Dalton—a privately owned Class Sub-2, one mile northeast of the city and Civil Aeronautics Administration Site No. 9, Class Sub-3, located five miles southwest of Williams. Dalton Field serves the local requirement for a small airport located conveniently close to town. However, provision should be made for protecting the site for permanent airport use. It is the policy of the Civil Aeronautics Administration to eliminate their intermediate fields wherever suitable airport facilities are otherwise available. The Dalton

Field site immediately adjacent to the city, is therefore recommended for development to a Class 2, rather than the CAA site four miles distant from the city. A full standard Class 2 Williams airport would serve the major portion of Williams Township with a 1950 private plane potential of 24 and a 1955 potential of 53 private planes.

Arbuckle

Located 11 miles southeast of Williams it serves a territory embracing all of southeastern Colusa County and northern Yolo County. Since no other facilities are available between Williams and Woodland, it is recommended that the present Class substandard 1 be developed to a full Class 1 by 1950 to meet the non-scheduled flying needs of the community for the period covered by this study. The 1955 potential private plane ownership for the service area of this airport is approximately 15 non-scheduled aircraft, principally drawn from northern Yolo County.

TEHAMA COUNTY

Corning

One of the older privately owned air fields in California is located at Corning. Its present classification, S-2, indicates few improvements have been made since it was established. It is in need of runway surfacing, grading and lighting to qualify for a Class 2 airport. These improvements are recommended not only to serve the district of which it is the center, but for use of aircraft flying civil airway Amber 1 which passes directly over the airport. Corning Airport improved to a full Class 2 by 1950 would adequately serve southern Tehama County and the northwesterly portion of Butte County. Corning Township private plane potential is 22 for 1950 and 52 for 1955.

Mineral

Mineral is recommended for development to a standard Class 2 facility by 1950. At present it is served by a private S-1 airport. High in the Sierra Nevada Mountains at an elevation of 5,000 feet, Mineral is the southern gateway to Lassen Volcanic National Park, also an headquarters for the National Park Service. Thousands of summer tourists and winter sports enthusiasts visit this area each year with Lassen Peak as their goal. It is a region of great scientific and scenic interest as Mount Lassen is the only active volcano in the United States with attendant fumaroles, boiling mud pots, boiling lakes and volcanic cones. The U. S. Forest Service has requested a Class 2 facility at this location to serve their needs. A facility of standard Class 2 specifications at this location is also desirable from a safety standpoint in that air traffic between Susanville and valley points, and between Alturas and Sacramento, passes over this locality. No other suitable emergency landing field exists within a radius of 25 miles.

Red Bluff

Bidwell Field, Red Bluff, receiving service on United's main coast line route and a feederline stop of Southwest Airways, is included in the 1947 National Airport Plan for improvement to a Class 4 facility. This development is an urgent recommendation of this report.

GLENN COUNTY

The existing high standard facilities at Willows and Orland are believed to be adequate for the projected private airplane potential for Glenn County during the life of this program.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 12

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Butte County							
Gridley.....		Private.....	S-2	2	NS		
N.E. Butte County.....						1	R,NS
Colusa County							
Colusa.....	Falcon.....	Private.....	S-2			2	NS
Stonyford.....				1	R,FS,NS		
Williams.....	Dalton.....	Private.....	S-2	2	R,NS		
Arbuckle.....	Vawters.....	Private.....	(S-1)	1	NS		
Tehama County							
Corning.....	Woodson.....	Private.....	S-2	2	NS,FS		
Mineral.....		Private.....	(S-1)	2	R,FS,NS		
Red Bluff.....	Bidwell.....	Public.....	3	4	AE,FE,C,NS		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

APPENDIX 13

AREA 13—MODOC PLATEAU

NATURAL CHARACTERISTICS

Area 13 comprises the Counties of Modoc, Lassen and Plumas, all bordering on Nevada, with Modoc also bordering on Oregon. It is one of the more remote Areas of the State. It is located, for the most part, east of the Sierra Nevada Mountains and is generally known as the Modoc Plateau.

Geography and Topography

The topography of this extreme northeastern portion of California consists of a heterogeneous grouping of mountain ranges, various sized mountain valleys, and high arid plateaus and lava flows. The mountainous area is crisscrossed with canyons and ridges. The Sierra Nevadas extend along the entire length of the western edge of these counties and the eastern section levels off to the high plateaus which border Nevada. Elevations range from 1,565 feet at the western edge of Plumas County to nearly 10,000 at Eagle Peak in the southeastern part of Modoc County and most of the Area has an elevation of more than 4,000 feet. The mountain sides are heavily forested and game and fish abound.

The Area is drained by the Pit, Susan, and Feather Rivers. Numerous large natural and a few artificial lakes are a prominent feature of the rugged mountain scenery. There is already considerable hydroelectric development and possibilities of much more.

Climate

The climate throughout the Area is that characteristic of a mountain region—dry, bracing air during the summer and severe winters with heavy snowfalls at the higher altitudes. At Quincy, with an elevation of 3,409 feet, January average temperatures range between 27.7° and 45.3° and July temperatures between 43.7° and 87.8°. At Portola, more than a thousand feet higher, the temperature in January falls as low as 13.9° and goes as high as 43.3°. In July the average temperatures are between 39.6° and 86.5°. The invigorating climate undoubtedly contributes to the attractiveness of the Area for sportsmen.

Land Usage

The following tabulation of land usage shows that less than one-seventh of the land in Area 13 is devoted to farms while nearly one-half is covered by National forests and parks. (From Table 15) :

	<i>Acres</i>	
Land in Farms-----	1,000,038	
Woodland and Other-----	1,519,031	
Total Privately Owned-----		2,519,069
National Forests and Parks---	2,996,819	
Other Public Lands-----	1,659,792	
Total Publicly Owned-----		4,656,611
Total Land in Area-----		7,175,680

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

The Modoc Plateau Area is rich in natural resources, many of them inadequately developed as yet. Lumbering, agriculture, and mining are all capable of expansion. In the future, recreational attractions should considerably augment local air passenger requirements.

Agriculture

Agriculture is mainly concentrated in Lassen and Modoc Counties. Because of the nature of the land, water supply and other physiographical conditions existing in the Modoc Plateau, livestock industry is the major source of agricultural income. Hay and some of the hardier vegetables are also grown to a certain extent. The seven chief agricultural products follow in order of value:

County	1st	2nd	3rd	4th	5th	6th	7th
Lassen	Beef	Sheep	Hay	Dairy	Grain	Poultry	Potatoes
Modoc	Beef	Potatoes	Barley	Dairy	Hay	Oats	Sheep
Plumas							

In 1945 Lassen County shipped out one carload of white potatoes, and Modoc 172 carloads of potatoes and 5 carloads of onions.

In the following summary of gross cash farm income in Area 13 during 1940 and 1945 the Area total appears small when compared with State and National totals, but it must be recalled that the population of the Area is also small. In 1940 the per capita cash farm income of the Modoc Plateau was \$200 or 206.19 percent of the State per capita. In 1945 the per capita cash farm income rose to \$424 or 144.22 percent of the State average.

The Area's agricultural industry may make limited demands on aviation for seeding and crop dusting but neither the types nor quantities of farm products, so far as we know at present, would lend themselves to air transportation.

CALIFORNIA AIRPORTS

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			Percent Change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	8,343,000	-----	100.00	20,780,900	-----	100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Lassen.....	2,300	.34	.03	5,317	.30	.03	131.17
Modoc.....	3,700	.55	.04	9,405	.52	.04	154.19
Plumas.....	940	.14	.01	1,820	.10	.01	93.61
Total Area 13.....	6,940	1.03	.08	16,542	.92	.08	125.66

Source: California Crop and Livestock Reporting Service.

United States totals from *Statistical Abstract of the United States*, 1946.**Timber Production**

Area 13 produces annually over one-fifth of all the lumber cut in California and has nearly one-sixth of the State's available supply of merchantable timber. The Area ranks third in the State in total volume of lumber stands, and second in the quantity produced in 1945.

With proper application of sound forest practices, better utilization of waste product, and expansion of the lumber using industries within the Area, timber production can become an even more valuable source of local wealth than it is at present. The following listing from Table 23 shows the comparative available timber supply and annual production in Area 13 and the State:

AVAILABLE TIMBER SUPPLY AND ANNUAL LUMBER PRODUCTION IN CALIFORNIA AND AREA 13

	Amount Available Feet B.M.	(Percent of California)	Number of Mills	(Percent of California)	1945 Production Feet B.M.	(Percent of California)
California.....	182,258,290,000	100.0	457	100.0	2,260,792,000	100.00
Area 13.....	28,726,970,000	15.7	34	7.4	484,948,000	21.45

Supplementing their commercial value, these forests, full of abundant wild life, form one of the principal local attractions for visitors and sportsmen. Lassen, Modoc, Plumas, and Tahoe National Forests cover many square miles. Aviation development in the Area will be influenced both by airport requirements of visitors arriving by airplane and airports needed by the Federal and State Forestry Services to patrol and safeguard these valuable natural resources. A summary of the facilities requested by these forestry services follows:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 13 by Counties

Lassen County

1. Class 2 at Bieber—United States Forest Service
2. Class 2 at Susanville—United States Forest Service
3. Class 2 at Westwood—United States Forest Service
The State Division of Forestry will use Ravendale, Bieber and Susanville Airports in their existing condition.

Modoc County

1. Class 2 at Adin—United States Forest Service
2. Class 2 at Alturas—United States Forest Service
3. Class 2 at Cedarville—United States Forest Service
The State Division of Forestry will use Alturas Municipal Airport in its present condition.

Plumas County

1. Class 2 at Beckwourth—United States Forest Service
2. Class 2 at Chester—United States Forest Service
3. Class 2 at Quincy—United States Forest Service

Mineral Production

Mineral production is relatively unimportant in the Area's economy. All three counties produce some building stone but most of the mining is found in Plumas County. Gold was this county's principal product for 65 years. Later, silver and copper were mined in considerable quantity. Deposits of many other minerals exist in unknown quantity. Aeronautical development may facilitate exploring and surveying these deposits in remote sections. A tabulation of the value of mineral production in the Area since 1930 follows:

VALUE OF MINERAL PRODUCTION IN AREA 13

	Mineral Production	Percent of Cali- fornia	Percent of U. S.	Percent Change from Preceding Period
1930				
Lassen.....	\$18,094	.01	-----	-----
Modoc.....	16,250	-----	-----	-----
Plumas.....	3,219,900	.88	.07	-----
Total.....	\$3,254,244	.89	.07	-----
1935				
Lassen.....	\$21,732	.01	-----	20.11
Modoc.....	52,432	.02	-----	222.66
Plumas.....	414,516	.16	.01	-87.13
Total.....	\$488,680	.19	.01	-84.98
1940				
Lassen.....	\$14,869	-----	-----	-31.48
Modoc.....	93,042	.03	-----	77.45
Plumas.....	2,743,608	.80	.05	561.88
Total.....	\$2,851,519	.83	.05	483.51
1945				
Lassen.....	\$20,635	-----	-----	38.78
Modoc.....	193,156	.04	-----	107.60
Plumas.....	41,243	.01	-----	-98.50
Total.....	\$255,034	.05	-----	-91.06

Source: *Minerals Yearbook Review of 1940, California Division of Mines Bulletins*, California State Chamber of Commerce. (See Table 22.)

Manufacturing

The Modoc Plateau Area's industry revolves almost entirely around lumber and its related products. There are, however, several other small manufacturing establishments engaged in the production of butter and cheese, peat moss, pumice stone, building bricks, meat packing, soft drinks and bakery products, and printing and publishing. As better utilization is made of wood as a natural resource, there may be some expansion of industry in Area 13, and some percentage of industrial specialties in the future might be adaptable to air freight. There is no basis at present for making any prediction of the potential volume.

Tourist and Travel Industry

The extensive recreational opportunities existing in Area 13 remain largely untouched. The natural scenic beauty of the many lakes and streams, the jagged peaks and mountains covered with forests in the west, and the wide open spaces of the east have a wide appeal for sportsmen, campers, and vacationists. Game is abundant and it has been estimated that the Area has 90 percent of the muletail deer in the country. Except for a few locations, such as the Feather River Canyon, Lake Almanor, and several mountain lakes, recreational facilities have been undeveloped. It is only during the past decade, with the advent of better roads and tourist accommodations, that sportsmen and tourists have become aware of the attractions of this exten-

sive northern portion of the Sierra Nevada Range. Lassen Volcanic National Park and the unique Lava Beds are located partly in this Area. The National Park, as shown in Table 16, was visited by 108,663 tourists in 1941 and 95,981 in 1946. The Lava Beds attracted 34,659 visitors in 1941 and 27,221 in 1946. Winter sports have been developing much more slowly than the possibilities warrant. Airports should be carefully planned and located to accommodate tourists using private aircraft or travelling by commercial air lines. The establishment of air transportation would make the Area more readily available to thousands, and the tourist industry might well become the main factor of the Area's economy.

Distribution and Transportation

Two railroads have operative holdings in this Area. A branch line from the Ogden route of the Southern Pacific crosses the northeast corner of California and serves the communities between Reno, Nevada and Klamath Falls, Oregon, i.e., Susanville, Westwood, Alturas, Canby and Tulelake; a second line branches at Alturas and goes north to Lakeview, Oregon, its northern terminus. The transcontinental line of the Western Pacific Railroad, which follows the famous Feather River Canyon, crosses the southern portion of the Area and a branch line from Keddie goes north to connect at Bieber with the Great Northern Railroad from Klamath Falls, Oregon. Neither Modoc nor Lassen residents, with the exception of those in the extreme south of Lassen County, are served with passenger service by either of these two railroads, although that portion of Plumas County which is bisected by the Western Pacific has several points where passengers may be picked up and discharged.

The Area is fairly well served with highways but certain sections of the roads are in need of realignment and better surfacing. U. S. Highway No. 395 (Mexico to Canada via Reno, Nevada and Lakeview, Oregon) skirts the eastern edge of all three counties, while U. S. Highway No. 299 provides an outlet to the Sacramento Valley for the residents of the northern section. State Routes 139, 36 and 24, respectively, connect Alturas with Klamath Falls, Oregon; Susanville and Westwood with Red Bluff; and Quincy and communities along the Feather River with Oroville. State Route 89 connects Route 36 with Route 24 at Chester and Keddie in Plumas County.

All processed foods, nearly all fruits and vegetables and all manufactured goods are shipped into this Area by train or truck from shipping points at Klamath Falls, Oregon; Reno, Nevada; or cities in the Sacramento Valley. Nearly all of the production, industrial and agricultural, is shipped out—livestock primarily to Reno, Stockton and San Francisco; lumber to varied United States destinations; barley to Milwaukee; potatoes and onions to southern growers as certified seed or to metropolitan centers for food.

Much of the daily commerce for Area 13 is carried on with cities located in states other than California because surface transportation facilities to Reno and Klamath Falls are relatively better, both in respect to time and distance, than those to other trading centers inside California, the nearest of which are Redding and Oroville. The existence of adequate aviation facilities would tend to promote better trade relations with other California trading areas.

Because of the distances, in both mileage and travel time between Counties in Area 13 and other parts of California, more adequate aviation facilities are sorely needed. As can be seen in Table 61, this Area ranks second in the State in the ratio of number of planes to population and shows the enthusiasm which its residents, living in a more or less isolated district, have developed for aviation and everything that aviation has to offer. Applications for scheduled feeder-service to this Area have been made to CAA, but have not been approved to date because of lack of the potential revenue and adequate landing facilities. An adequate system of airports and the full utilization of air transportation would enable the inhabitants of this Area to

travel the long distances to other populated centers and return home without the loss of from one to two days in travel time.

Indices of Purchasing Power

Table 128 lists various indices of purchasing power for Area 13 with comparisons to State averages. In 1940 the Area's per capita income was third highest in the State; in 1945 it was fourth. The State's average income of 1940 and 1945 totals was \$1,089 while the Area's average income was \$1,052, only slightly lower. Although the Area's per capita income is close to the State average, per capita retail sales present an entirely different picture. The State's average per capita retail sales for 1940 and 1945 was \$601, the Area's only \$376. This results primarily from purchases by mail and buying in cities outside the Area, notably Reno, Nevada and Klamath Falls, Oregon. The introduction of a convenient air transportation system, making California shopping centers as available to the Area's residents as out of State trading points, would result in the retention of a large share of these purchases by California communities.

TABLE 128
INDICES OF PURCHASING POWER FOR AREA 13
Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
(In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Lassen.....	\$4,039	.10	\$5,336	.10	\$6,441	.09	\$8,379	.10
Modoc.....	1,849	.04	2,799	.05	3,526	.05	4,243	.05
Plumas.....	1,776	.04	2,503	.04	3,356	.05	3,969	.04
Totals.....	\$7,664	.18	\$10,638	.19	\$13,323	.19	\$16,591	.19

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			Percent Change, 1940 to 1945
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	
Lassen.....	\$11,699	\$808	100.62	\$24,765	\$1,321	96.14	63.49
Modoc.....	6,793	780	97.14	14,658	1,527	111.14	95.77
Plumas.....	8,554	741	92.28	12,318	1,151	83.77	55.33
Totals.....	\$27,046	\$779	97.03	\$51,741	\$1,325	96.43	70.09

TABLE 128—Continued
 INDICES OF PURCHASING POWER FOR AREA 13
 Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Lassen.....	\$23,918,890	\$1,900	105.73	-----	\$13,992,062	\$1,217	111.75	—35.95
Modoc.....	16,884,717	2,101	116.92	-----	11,939,908	1,802	165.47	—14.23
Plumas.....	21,299,064	2,692	149.81	-----	22,885,210	2,536	232.87	—5.80
Totals.....	\$62,102,671	\$2,176	121.09	-----	\$48,817,180	\$1,798	165.11	—17.37
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Lassen.....	\$15,236,865	\$1,052	101.84	—13.56	\$17,277,637	\$921	65.60	—12.51
Modoc.....	11,573,920	1,328	128.56	—26.31	13,967,790	1,455	103.63	9.56
Plumas.....	23,723,170	2,054	198.84	—19.01	24,732,195	2,311	164.60	12.51
Totals.....	\$50,533,955	\$1,455	140.84	—19.08	\$55,977,622	\$1,433	102.07	—1.51

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Lassen.....	\$5,464	\$434	76.68	-----	\$4,158	\$362	94.52	—16.59
Modoc.....	3,011	375	66.25	-----	1,910	288	75.20	—23.20
Plumas.....	2,631	332	58.66	-----	2,347	260	67.89	—21.69
Totals.....	\$11,106	\$389	68.73	-----	\$8,415	\$310	80.94	—20.31
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Lassen.....	\$5,631	\$389	84.38	7.46	\$8,678	\$599	81.06	53.98
Modoc.....	2,467	283	61.39	—1.74	4,404	505	68.34	78.45
Plumas.....	3,971	344	74.62	32.31	6,136	531	71.85	54.36
Totals.....	\$12,069	\$347	75.27	11.94	\$19,218	\$553	74.83	59.37

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California. Division of Motor Vehicles.

TABLE 128—Continued
 INDICES OF PURCHASING POWER—AREA 13
 Per Capita Automobile and Truck Registrations ^a—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Lassen.....	3,997	.32	88.89	-----	4,270	.37	105.71	15.63
Modoc.....	3,082	.38	105.56	-----	2,470	.37	105.71	—2.63
Plumas.....	2,455	.31	86.11	-----	2,775	.31	88.57	-----
Totals.....	9,534	.33	91.67	-----	9,515	.35	100.00	6.06
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Lassen.....	5,938	.41	103.00	10.81	4,970	.27	87.10	—34.15
Modoc.....	3,665	.42	105.00	13.51	2,925	.30	96.77	—28.57
Plumas.....	4,412	.38	95.00	22.58	3,538	.33	106.45	—13.16
Totals.....	14,015	.40	100.00	14.29	11,433	.29	93.55	—27.50

Population

Table 129 lists the population of the Area by five year periods with projections for 1950 and 1955. It will be noted that although the Modoc Plateau Area has a total acreage of 7,175,680 acres, or 7.15 percent of the State total, it had only 39,050 residents in 1945, or .43 percent of the State's total population. It is anticipated that the Area will grow until 1955 at approximately the same rate as the State as a whole. Table 130

gives the population of incorporated and unincorporated cities in the Area.

An examination of the economic factors involved seems to indicate that aeronautical development in Area 13 will be influenced mainly by the necessity of improving transportation to and from the Area. Improved transportation facilities will permit a better exploitation of the natural resources of the Area and bring this northern Sierra Nevada region more definitely within the trading sphere of the rest of the State.

TABLE 129
 POPULATION OF AREA 13 BY FIVE-YEAR PERIODS
 1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930				1945			
Lassen.....	12,589	.22	-----	Lassen.....	18,750	.21	29.50
Modoc.....	8,038	.14	-----	Modoc.....	9,600	.10	10.18
Plumas.....	7,913	.14	-----	Plumas.....	10,700	.12	—7.34
Total Area 13.....	28,540	.50	-----	Total Area 13.....	39,050	.43	12.41
1935				1950			
Lassen.....	11,495	.19	—8.69	Lassen.....	19,350	.19	3.20
Modoc.....	6,625	.11	—17.58	Modoc.....	10,550	.11	9.89
Plumas.....	9,025	.15	14.05	Plumas.....	10,900	.11	1.87
Total Area 13.....	27,145	.45	—4.89	Total Area 13.....	40,800	.41	4.48
1940				1955			
Lassen.....	14,479	.21	25.96	Lassen.....	21,300	.19	10.08
Modoc.....	8,713	.13	31.52	Modoc.....	11,775	.11	11.61
Plumas.....	11,548	.17	27.96	Plumas.....	12,075	.11	10.78
Total Area 13.....	34,740	.51	27.98	Total Area 13.....	45,150	.41	10.66

Source: Same as Table 93, Page 244.

TABLE 130
POPULATION STATISTICS OF AREA 13
Incorporated Places

Aviation Area, Counties Cities	Date Incor- porated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 13.....		14,244	16,252	19,613	28,540	34,740	†42,300	
Lassen County.....		4,511	4,802	8,507	12,589	14,479	†20,000	
Susanville.....	1900		688	918	1,358	1,575		
Modoc County.....		5,076	6,191	5,425	8,038	8,713	†9,700	
Alturas.....	1901		916	979	2,338	2,090		
Plumas County.....		4,657	5,259	5,681	7,913	11,548	†12,600	
Portola.....	1946					1,918		

† Estimate of California Taxpayers' Association.

Unincorporated Places

	Popula- tion		Popula- tion
Lassen County		Plumas County	
Bieber.....	300	Beckwourth.....	150
Janesville.....	200	Belden.....	125
Madeline.....	100	Blairsdon.....	350
Nubieber.....	150	Chester.....	600
Pittville.....	150	Crescent Mills.....	300
Standish.....	125	Delleker.....	250
Susanville Suburbs.....	3,661	Graeagle.....	300
Westwood.....	5,064	Greenville.....	1,246
Modoc County		Keddie.....	285
Adin.....	250	La Porte.....	275
Cedarville.....	500	Quincy.....	1,126
Eagleville.....	225	Sloat.....	250
Fort Bidwell.....	300	Spring Garden.....	125
Lake City.....	100	Taylorsville.....	300
Likely.....	125	Twain.....	150
Lookout.....	125	Virgilia.....	375
Whitehorse.....	250	Walkermine.....	884
Willowbranch.....	150		

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

Notwithstanding its obvious need of such form of transportation, Area 13 has continued up to the present without scheduled air service. Part of the explanation for this lies in the sparseness of the population, part in the presence of natural mountain barriers to more populous sections of the State, part in the fact that the Area does not lie in the path of any air route connecting two large population centers.

One natural airway in the Area lies to the east of the Sierra Nevada Range and runs in a northwest-southeast direction between Reno, Nevada and Klamath Falls, Oregon by way of Susanville and Alturas. Three other feasible routes extend between Oroville and Susanville by way of the Feather River Canyon, Susan-

ville to Red Bluff via Westwood and Chester, and Alturas to Redding via Canby, Fall River Mills, and Burney.

At present Southwest Airways has an application pending for scheduled service between Portola, Susanville, and Alturas northward to Klamath Falls and from Portola to the southern part of the State via Reno and Death Valley. In addition, there would be direct service between Susanville and Redding.

Listed below are the existing airports in the Area with their ownership and class designation. Plate M-13 gives certain further details and describes the position of the airports in each County.

Plate M-13

Code	City and Airport Name	Ownership	Class
MODOC COUNTY			
13-25	Alturas—No. 2	City of Alturas	4
13-26	Alturas—No. 1	City of Alturas	S-2
13-27	Cedarville	34th Agricultural District	S-1
13-28	Adin (proposed)	County of Modoc	-
13-50	Canby	Private	S-1
13-51	Likely	Private	S-1
13-52	Fort Bidwell	Private	S-1
13-53	Stronghold	Private	S-1
LASSEN COUNTY			
13- 6	Amedee—Honey Lake Flight Strip	United States Bureau of Public Roads	5
13- 7	Karlo—Secret Valley Intermediate Site 52	CAA	S-3
13-30	Susanville Municipal	City of Susanville	S-2
13-31	Bieber	County of Lassen	S-2
13-32	Westwood	County of Lassen	S-1
13-60	Ravendale	Private	S-1
PLUMAS COUNTY			
13-11	Chester	USFS	S-2
13-35	Beckwourth	County of Plumas	S-2
13-36	Quincy (proposed)	County of Plumas	2
13-70	Quincy—Sky Harbor	Commercial-Private	1

ESTIMATES OF SCHEDULED AIR TRAFFIC

Following the discussion on scheduled aviation projection in the State treatment, Table 68 lists a passenger potential for existing and probable stops in the State. Based on the method of development there described, it is predicted that Area 13 will have 2,829 on and off passengers in 1950 and 4,109 in 1955. If the proposed north and south flights are instituted by Southwest

Airways these two daily schedules would suffice to handle the on and off passengers throughout the period covered by the present study.

Area 13 produces no agricultural perishables which are likely to move by air and has no specialities adaptable to air freight. Regular passenger airplanes could handle the local requirement for air express.

PRIVATE FLYING ESTIMATES

Proceeding from an index based on economic buying potential and current private airplane per capita ownership, as described in the development of Table 73, it is predicted that private aircraft will be distributed in Area 13 as follows:

County	Index	Private Plane Ownership	
		1950	1955
Lassen	101	38	84
Modoc	185	36	89
Plumas	264	56	129
Total		130	302

Potential private plane ownership is further divided among the judicial townships within each County by means of a formula based on population projections and average rentals. This calculation is also explained in the State treatment. A listing of the estimated total of private airplanes in each township for 1950 and 1955 is given below:

LASSEN COUNTY			
Township	Pct.	1950	1955
Big Valley	6.51	2	5
Honey Lake	59.27	23	50
Madeline	1.13	-	1
Westwood	33.09	13	28

MODOC COUNTY				
Township	Pct.	1950	1955	
Adin Lookout	10.30	4	9	
Alturas	49.85	18	44	
Bidwell	3.88	1	3	
Canby	4.03	1	4	
Tule Lake	10.47	4	9	
Cedarville	7.49	3	7	
Dewey	3.37	1	3	
Goose Lake	1.32	1	1	
Lake City	3.15	1	3	
Willow Ranch	6.14	2	6	

PLUMAS COUNTY				
Township	Pct.	1950	1955	
Beckwourth	29.75	17	37	
Goodwin	.23	-	-	
Indian	21.16	12	26	
Mineral	5.70	3	7	
Plumas	23.28	13	29	
Quartz	10.67	6	13	
Seneca	9.21	5	12	

These private aircraft projections are used as one of the bases helping to determine the following recommendations.

AIRPORT REQUIREMENTS

LASSEN COUNTY

The immediate environs of Amedee and Secret Valley are believed to be served by facilities which should prove adequate for the period under study if they are maintained at Civil Aeronautics Administration standards.

Bieber

Bieber is located in an agricultural area which also supports small sawmill and logging operations. It is 50 miles west of Alturas and 83 miles east of Redding, and is on the natural line of flight between these two cities. There is an existing Class S-2 airport. The citizens of Bieber contributed the money for buying the site of this field and then deeded it to the County. The airmindedness of this community of less than 1,500 people is evidenced by the fact that 6 aircraft were immediately based on the airstrip. Since that time, the field has been used by visitors and sportsmen during hunting seasons, and three commercial firms own part interest in locally based airplanes. Because of its accessibility to valuable nearby forests, the Federal Forest Service has requested that a Class 2 airport be provided at Bieber. The National Airport Plan has recommended only a Class 1 field here but it is felt that the need for a Class 2 airport is clearly demonstrated both to accommodate local airplane owners and the aircraft of visitors and hunters and to comply with the request of the United States Forest Service. The fact that Bieber is distant from surrounding large towns and, particularly, the distance and lack of good transportation between Bieber and Susanville, the County seat, are confirmatory reasons for this decision.

Madeline Plains

The desirability of having an emergency landing field near Madeline Plains, which is in the east-central portion of Lassen County on a direct airline between Reno and Alturas, has been demonstrated on numerous occasions. Although much of the country is flat, inundations during the wet season make a landing strip necessary. The district is sparsely populated and the private plane potential negligible, but several local ranchers are already utilizing aircraft for transportation to trading centers. The National Airport Plan for 1947 recommends a Class 1 field at Ravendale. The existing substandard Class 1 airstrip here is poorly drained and the Lassen County Planning Commission has proposed a new site at Termo. Acquiring the new site and developing a Class 1 airport at Madeline Plains or Termo would probably cost less than draining the field at Ravendale.

Susanville

An airport at Susanville will eventually serve the entire northern part of Honey Lake Valley. This dis-

trict has a population of about 9,000 with 2,178 consumer units earning less than \$5,000 per year, 199 consumer units earning from \$5,000 to \$15,000, and 32 consumer units earning over \$15,000. It is predicted that this region will have 23 private planes in 1950 and 50 in 1955. The community has wished for several years to have scheduled feeder-service established connecting Susanville with Klamath Falls and Reno. An application for certification for this service and also regular air service with Redding is pending. There is little doubt that such feeder-service will soon be instituted. The United States Forest Service has asked for a Class 2 airport at Susanville and the National Airport Plan for 1947 recommends an airport of the same class. A Class 2 field would be adequate for the estimated private plane ownership, but the certainty of coming feederline service makes it advisable to proceed not only to develop the present S-2 Class municipal airport into a full Class 2 but to expand the field to Class 3.

Westwood

Westwood is a large sawmill town of over 5,000 population, located 22 miles west of Susanville and 85 miles east of Red Bluff, on a direct airline between these two cities. The community has been interested in aviation for a number of years and the County-owned substandard Class 1 airport was recently relocated at a more convenient site. It is believed that there will be 13 private aircraft stationed here in 1950 and 28 in 1955. The National Airport Plan for 1947 recommends a Class 2 airfield at Westwood and the United States Forest Service requests the same class facilities. Because of the non-scheduled flying estimates and the convenience of an airport here for fishermen coming to Lake Almanor, these recommendations should be adopted and a Class 2 airport built by 1950.

MODOC COUNTY

Adin

Adin's economy is based partly on agriculture but even more so on a small sawmill which utilizes a forest service timber working circle on a sustained yield basis. This community, separated from Alturas, 40 miles to the east, by a range of mountains, has already provided itself with a makeshift airstrip which sees considerable use during the summer months. The Federal Airport Program for 1947 includes a Class 1 airport here, and the United States Forest Service would like a Class 2 field. Because of the low private aircraft potential, however, it is felt that a Class 1 airport would be adequate.

Alturas

Alturas is served at present by a substandard Class 2 airport located within the city and a Class 4 airstrip lying 7 miles westnorthwest. The first field is poorly

located for future development since available space is limited and lengthening the runways would involve moving railroad tracks, telephone poles and power lines. The Class 4 airstrip, entirely adequate for loading large planes, is not suitable for light aircraft because of prevailing cross-winds. Its location, 7 miles from Alturas, is inconvenient. The Modoc County Planning Commission has recommended a new location for a Class 3 airport, east of and immediately adjacent to the city. This would suggest abandonment of both existing fields.

The Class 4 airport, built as a war emergency under wartime conditions, is disadvantageously situated for commercial purposes. Rather than squandering additional money to build an access road to this field, Alturas could, for the same or less money, build a new airport near the city. Inasmuch as feederline service is bound to come by 1950, the airport should be Class 3.

The private airplane potential indicates that Alturas should have 18 aircraft by 1950 and 44 by 1955. As already mentioned, the existing Class 4 airport is not suited for light airplanes because of cross-winds and the Class S-2 field could be brought up to Civil Aeronautics Administration standards only at considerable expense. The suggested new airport would be convenient for city enthusiasts in aviation and for the visitors coming by airplane to enjoy the recreational attractions of the district.

The United States Forest Service has asked for a Class 2 airport at Alturas but might be persuaded to cooperate in establishing a Class 3 field because of the difficulty of developing present facilities. The contemplated feederline service would make a Class 3 airport imperative.

Cedarville

Cedarville is located in Surprise Valley 24 miles east of Alturas and is separated from that city by a high range of mountains. Although the region is sparsely populated, Cedarville is the site of the County Fair and is centrally located in a valley surrounded by a high range of mountains often impassable in winter. It is believed that the community will develop a private airplane potential of 3 by 1950 and 7 by 1955. There are excellent possibilities of the community attracting increasing numbers of sportsmen and vacationists. The National Airport Plan for 1947 provides for a Class 1 field here and the United States Forest Service wishes a Class 2. The existing substandard Class 1 airstrip owned by the 34th Agricultural District is poorly located for safe flying and a new site has been chosen northeast of the town. To satisfy local and visitor's private aircraft requirements and the needs of the Forest Service, it is recommended that Cedarville have a Class 1 airport at the new site.

Fort Bidwell

Fort Bidwell is also located in Surprise Valley 25 miles north of Cedarville. The community now has a

private airstrip and it is believed that this should be brought up to full Class 1 standards. Such a step is indicated because the district is isolated by mountain ranges and because of the possible future private airplane ownership.

New Pine Creek

New Pine Creek lies east of Goose Lake on the western slope of the Warner Range, close to the Oregon border. It is predicted that the town might have 2 airplanes in 1950 and 6 in 1955. A Class 1 airport is recommended by 1955 to handle the local aircraft and serve as an emergency landing field. The need for emergency airports between Alturas and Lakeview, Oregon has been clearly demonstrated during the past several years.

Tule Lake Basin

This section is in the southern part of the United States Bureau of Reclamation's Tulelake Project in the Klamath Basin. The population is expected to increase to 7,000 by 1955 and average annual income of the district's inhabitants is above the State average. A private airplane potential of 4 in 1950 and 9 in 1955 is predicted for the community. Because of its position in the State, the inhabitants will be increasingly interested in faster transportation to marketing and trading centers. There are extensive opportunities for deer hunting and duck shooting in Tulelake Basin and sportsmen with only a few days to spare for their favorite sport should grasp any opportunity for rapid transportation to one of the best hunting grounds in the State. The Lava Beds National Monument, extending into Siskiyou County, is the scene of one of America's historic Indian wars and is made up of a weird congeries of underground caverns and corridors, the resultant of some past volcanic catastrophe. Hundreds visit this curiosity yearly, and facilities for airplane transportation should add to their number. To accommodate the private aircraft of the inhabitants, sportsmen, and tourists it is advisable that the existing S-1 private airfield at Stronghold be developed to Class 2 by 1950 or earlier.

PLUMAS COUNTY

Beckwourth

Beckwourth lies in an agricultural valley with forested districts to the westward. It is believed that the airplane potential will reach 17 in 1950 and 37 in 1955. Supplementing local owners of aircraft will be visitors coming by airplane to several summer resorts situated in the neighborhood. The United States Forestry Service asks for a Class 2 airport here while the National Airport Plan for 1947 recommends only a Class 1 field. There are proposals on foot for a feederline stop in this vicinity and Beckwourth with its existing S-2 airfield is the logical station for this purpose. The possibility of immediate feederline service, the non-

scheduled flying estimates, the possible development of recreational facilities, and the requirements of the forestry service, considered together, will necessitate a Class 3 airfield at Beckwourth by 1950.

Chester

Chester, in the northwestern corner of Plumas County, is served by a substandard Class 2 airport owned by the United States Forestry Service. The Forestry Service has expressed its desire to bring this airfield up to standard and other community needs strengthen this recommendation. It is predicted that the community will have 5 airplanes by 1950 and 12 by 1955. Chester is the center of the Lassen Park-Lake Almanor resort section and summer resorts will add to the necessity of adequate airport facilities. The 1947 National Airport Plan confirms the recommendation by proposing a Class 2 field here.

Greenville

Indian Valley, one of the few level districts in Plumas County, is about equidistant between Chester and Quincy. The district is estimated to have a population of over 3,000, most of whom are engaged in lumbering and mining. The private plane ownership

potential for 1950 is 12, increasing to 26 in 1955. Good fishing and hunting are found in the neighborhood and should attract even more sportsmen when faster transportation becomes available. It is recommended that a Class 1 airport be constructed at Greenville to meet the private flying and recreational requirements of this entire valley.

Quincy

Quincy, the county seat, has a population of over a thousand and is the center of a growing recreational, lumbering, and mining district. For many years the town has been served by a private Class 1 airport which is considered hazardous. Recent acquisition of 103 acres only one-quarter mile from the town will provide a site which can meet all Civil Aeronautics Administration requirements for a Class 2 airport. It is believed that local conditions justify a field of this class. The airplane potential presumes a local ownership of 13 in 1950 and 29 in 1955. The United States Forestry Service desires a Class 2 airport at Quincy and the National Airport Plan for 1947 makes the same recommendation. Forestry needs, potential non-scheduled flying, and recreational development all warrant a Class 2 field.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 13

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Bieber.....	Bieber.....	County.....	S-2	2	R,NS,FS		
Ravendale-Madeline Plain.....		(Private).....	(S-1)	1	NS		
Susanville.....		Municipal.....	S-2	3	FP,FS,NS		
Westwood.....		County.....	S-1	2	R,FS,NS		
Modoc County							
Adin.....				1	FS,NS		
Alturas.....	Municipal No. 1.....	Municipal.....	S-2	3	FP,R,FS,NS		
Cedarville.....		34th Agri. Dist.....	S-1	1	R,FS,NS		
Fort Bidwell.....		(Private).....	(S-1)	1	NS		
New Pine Creek.....						1	NS
Stronghold-Tulelake.....		(Private).....	(S-1)	2	R,NS		
Plumas County							
Beckwourth.....		County.....	S-2	3	R,FP,FS,NS		
Chester.....		USFS.....	S-2	2	R,FS,NS		
Greenville.....				1	R,NS		
Quincy.....	Quincy Sky Harbor..	Private.....	1	2	R,FS,NS		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

APPENDIX 14

AREA 14—SHASTA-CASCADE REGION

NATURAL CHARACTERISTICS

Area 14, fourth largest in the State, is made up of Siskiyou, Shasta and Trinity Counties, thus including all of the Cascade Range, and most of the Klamath Mountains. This north central Aviation Area borders Oregon on the north and lies between the Redwood Empire and Modoc Plateau Areas.

Geography and Topography

The entire surface of the Shasta-Cascade Area—with the exception of the extreme northern part of the Sacramento Valley, Scott Valley and Shasta Valley—is mountainous and in many sections, still a wilderness accessible only by horseback or hiking. The area offers some of the wildest, roughest and most attractive scenery to be found in the State. Mount Shasta in the north central part is famed for its beauty; Mount Lassen in the southeast is the only active volcano in the United States; the Trinity Alps and Yolla Bolly—Middle Eel Reserve in the west have been set aside as permanent wildernesses to retain their primitive appeal for mountaineers and campers. Elevations range from 435 feet, at the northern end of the Sacramento Valley, to over 10,400 feet at Mount Lassen, 14,161 feet at Mount Shasta and nearly 10,400 feet in the Trinity Alps.

Principal rivers and streams in the Area are the Trinity, Eel, Mad, Van Deuzen, Pitt, McCloud, and headwaters of the Sacramento. The three latter are impounded by Shasta Dam, thus creating the State's largest hydro-electric power generation plant. Several other sites for potential water power development exist in the area.

Climate

The climate of Area 14 is governed almost entirely by elevation. The valleys have hot summers and mild

winters, the mountains cool summers, with a wide daily variation of temperature, and cold winters with heavy falls of snow. In the extreme west, the temperatures are influenced by the proximity of the ocean, only 45 miles distant. Rainfall is variable but, in general, heaviest in the west and lightest in the east. Redding, at an elevation of 590 feet, has average January temperatures varying from 37 to 54 degrees, and July temperatures varying between 67 and 97 degrees. The average rainfall here is 37 inches. At Yreka, which has an elevation of half a mile, January temperatures are as low as 24 degrees and as high as 44, while July temperatures fluctuate between 52 degrees and 92 degrees, and the average annual rainfall is only 17 inches. (See Table 14.)

Land Usage

Two principal conclusions can be drawn from the following land usage data taken from Table 15. Only 17 percent of the surface is devoted to agriculture and this percentage includes idle cropland and farm woodland. On the other hand, 62 percent of the land, most of it in public parks and forests, is publicly owned:

	Acres	Acres
Land in Crops.....	134,655	
Idle Cropland	147,352	
Farm Woodland	1,138,625	
Forest and Other.....	1,802,986	
Total Privately Owned.....		3,223,618
National Forests and Parks....	4,468,396	
Other Public	851,986	
Total Publicly Owned.....		5,320,382
Total Land in Area 14.....		8,544,000

ECONOMIC FACTORS AFFECTING AIRPORT MASTER PLANNING

Agriculture

Aeronautical development in the Shasta-Cascade Area will be mainly directed towards supplementing present surface transportation, for the benefit of the inhabitants and the high potential of tourists, sportsmen and visitors. The valuable and extensive forests will necessitate adequate facilities for patrol and safeguarding by aircraft. The lumbering and mining industries will make a limited but appreciable use of air service. Local economic factors should be carefully considered in planning airport facilities.

While Area 14 covers 8,554,000 acres, or 8.5 percent of the State's total acreage, only 1,430,632 acres of this land is in farms. The principal agricultural products are cattle, dairy products, sheep and wool, hogs, poultry, eggs, potatoes, grain, forage crops and berries. Extensive experiments are under way to develop special types of range grass and discover new plants and crops adapted to local soils and climate. Possible irrigation developments are also being studied with a view to extending existing holdings. The following tabulation shows the gross cash farm income of the Area for 1940 and 1945:

GROSS CASH FARM INCOME—1940 AND 1945

(From Table 40)

(In thousands of dollars)

	1940			1945			Percent change 1940 to 1945
	Cash Farm Income	Percent of California	Percent of U. S.	Cash Farm Income	Percent of California	Percent of U. S.	
United States.....	\$8,343,000		100.00	\$20,780,900		100.00	149.08
California.....	672,926	100.00	8.06	1,786,497	100.00	8.60	165.48
Shasta.....	2,300	.34	.03	5,000	.28	.03	117.39
Siskiyou.....	5,200	.77	.06	11,042	.62	.05	112.34
Trinity.....	335	.05	.01	706	.04		110.75
Total Area 14.....	\$7,835	1.16	.10	\$16,748	.94	.08	113.75

Source: California Crop and Livestock Reporting Service. United States totals from *Statistical Abstract of the United States*, 1946.

In general, the agricultural products of Area 14 do not appear suitable for air transportation at its present stage of development. Berries, however, are an excellent air freight candidate, and should the acreage devoted to berries be extended, the possibility of shipping this product by air should be examined.

Timber Production

The forests of Area 14 are valuable both from the viewpoint of commercial exploitation and attracting tourists. Shasta, Lassen, Klamath and Mendocino National Forests cover almost half of the land surface. Although timber has been cut for many years, it was estimated in 1945 that lumber stands still amounted to 52,206,000,000 board feet, and that production in that year equaled 425,814,000 board feet (see Table 23). The Shasta Cascade Area was thus second in the State in the volume of lumber available, and third in lumber production. At the present time there is definite need for some kind of air service into the more remote timber districts to provide fast delivery of repair parts, machinery and personnel to the sawmills. The loss of two or three days' production can be very costly to both management and labor. The National and State Forestry Services have a great interest in adequate airports to serve their aircraft. A summary of the needs of these services follows:

AIRPORT NEEDS OF THE CALIFORNIA DIVISION OF FORESTRY, DEPARTMENT OF NATURAL RESOURCES, AND OF THE UNITED STATES FOREST SERVICE

Area 14 by Counties

Shasta County

1. Class 1 at Viola—State Division of Forestry
2. Class 1 at Platina—State Division of Forestry
3. Class 2 at Fall River Mills (Shasta Sky Ranch)—State Division of Forestry

The State Division of Forestry will use Burney, Redding Municipal and Benton Field (Redding) in their present condition. The United States Forest Service will use the Redding Municipal Airport in its existing condition.

Siskiyou County

1. Class 1 at Etna—State Division of Forestry
2. Class 2 at Bray—United States Forest Service
3. Class 2 at Fort Jones—United States Forest Service
4. Class 2 at Happy Camp—United States Forest Service
5. Class 2 at Tulelake—United States Forest Service
6. Class 2 at Ash Creek—United States Forest Service
7. Class 2 at Dunsmuir—United States Forest Service

The State Division of Forestry will use Montague and Macdoel Airports in their present condition. The United States Forest Service will use Montague Airport in its existing condition.

Trinity County

1. Class 1 at Island Mountain—State Division of Forestry
 2. Class 2 at Hayfork—United States Forest Service
 3. Class 2 at Trinity Center—United States Forest Service
 4. Class 2 at Weaverville—United States Forest Service
- The State Division of Forestry will use Weaverville Airport in its present condition.

Tourist and Travel Industry

Nearly all of the Shasta-Cascade Area is recreationally attractive. The vast wildernesses in the west among the Trinity Alps offer unlimited possibilities to the robust vacationist for camping, mountain climbing and roughing it in general. Many spots offer unexcelled opportunities for deer hunting and fishing. The spectacular scenery, National Forests and National and State Parks attract thousands of tourists annually. The visitor has the choice of viewing Lassen Peak, an active volcano, or Mount Shasta, as impressive in its beauty as any mountain in the Nation. Lassen Volcanic National Park and the Lava Beds fascinate the curious scientific layman. Shasta Lake with 365 miles of shoreline is rapidly becoming a popular recreational center, and the thousands who come for boating and swimming also have the choice of seeing the world's second largest dam. Castle Crags, Burney Falls, Shasta Sprays, Sheep Rock and Pluto's Cave are a few of the additional attractions. Table 18 shows that the State Parks in the Area had almost 14,000 visitors in 1946. The following tabulation from Table 16 gives the volume of visitors to National Parks, recreational areas and monuments:

**VOLUME OF VISITORS TO NATIONAL PARKS
AND MONUMENTS—1941 AND 1946**

Name	County Location	Point of Entry	1941 Number of Visitors	1946 Number of Visitors
Lassen Volcanic.....	Shasta..... Lassen..... Plumas..... Tehama.....	Manzanita Lake..... Mineral.....	 108,663	 95,981
Shasta Lake.....	Shasta.....		NA	278,515
Lava Beds.....	Siskiyou..... Modoc.....	Tulelake.....	34,659	27,221
Totals.....			143,322	401,717

Source: Department of the Interior, National Park Service.

NA—Not available.

The volume of visitors to the Area is already large, but it could be multiplied many times with the proper development of facilities and resorts. Adequate air transportation to and from the various attractions might augment the tourist industry to the point where it became the mainstay of the Area's economy.

Mineral Production

The mineral production of Area 14 has varied with the years, but has always accounted for a substantial portion of local income. From the time records were first kept to 1943, the Area had produced minerals

valued at \$295,936,301, an amount equal to 2.64 percent of California's total. At one time considerable copper was mined. Stone, pyrite, manganese and quicksilver are also found. Local gold mining was interrupted by the war but is now being resumed. The exploitation of known deposits of ore has been retarded to date by transportation difficulties. It is possible that some of these more inaccessible deposits could be worked if aircraft were used for transportation of personnel, machinery and supplies. Following are totals of the value of mineral production in the Area by Counties, from 1930 to 1945:

**VALUE OF MINERAL PRODUCTION IN AREA 14
(Compare With Table 22)**

Year	County	Mineral Production	Percent of California	Percent of U. S.	Percent of Change
1930.....	Area Total.....	\$1,783,880	.49	.04	
	Shasta.....	1,111,146	.30	.02	
	Siskiyou.....	235,401	.07	.01	
	Trinity.....	437,333	.12	.01	
1935.....	Area Total.....	\$2,801,185	1.06	.08	57.03
	Shasta.....	1,350,262	.51	.04	21.52
	Siskiyou.....	705,737	.27	.02	199.80
	Trinity.....	745,186	.28	.02	70.39
1940.....	Area Total.....	\$6,791,326	1.98	.12	142.44
	Shasta.....	2,799,796	.81	.05	107.35
	Siskiyou.....	2,219,203	.65	.04	214.45
	Trinity.....	1,772,327	.52	.03	137.84
1945.....	Area Total.....	\$3,137,667	.66		—53.80
	Shasta.....	2,119,802	.45		—24.29
	Siskiyou.....	926,305	.19		—58.26
	Trinity.....	91,560	.02		—48.34

Source: Minerals Yearbook Review of 1940, Division of Mines Bulletins 110-112, 130, Press Bulletin No. 283.

California State Chamber of Commerce, Economic Survey, Series 1944-45, Report No. 21.

Manufacturing

There are a number of small manufacturing industries primarily serving local needs. Beverages, cheese,

grain mill produce, dressed meat and wine are the principal products. There are also a few foundries, machine shops and printing and publishing establishments. The recent construction at Shasta Dam of a

pilot plant for test-production of alloy steel ingots should help answer some of the mineral production problems of the Area. Future industrial development will doubtless revolve around lumber and lumber products, the extent depending upon the lumber industry's initiative and the possibility of processing lumber into end products and utilizing forest products now thought of as waste. Employment of air service by local industries will probably be incidental in the near future.

Distribution and Transportation

The Southern Pacific Railway's Shasta Route runs north and south through the Area with a branch line connecting Klamath Falls with the Shasta Route at a point between Dunsmuir and Mount Shasta City. The McCloud River Railroad, used principally for logging and lumbering purposes, serves a small section of Siskiyou County southeast of Mount Shasta, connecting with the Southern Pacific at Mount Shasta City, and with the Great Northern in Modoc County. The Northwestern Pacific cuts across the extreme southwest of Area 14 and serves a very limited district.

Highway No. 99 parallels the Southern Pacific Railroad and No. 97 follows much the same route as the branch railroad line to Klamath Falls. Highway No. 299 runs east and west through the southern half of the Area. State Route No. 89 serves the section between Mount Shasta and Mount Lassen, and Route No. 44 runs from Redding east to Lassen Volcanic National Park.

With the exception of the Southern Pacific Railway, and Highways No. 99 and parts of No. 299, most of the remaining surface transportation facilities are

inadequate to serve the needs of the Area. The long distances between centers of population and the rough, mountainous terrain, make travelling time unusually long. Whereas a 150-mile trip usually takes three or four hours in most parts of the State, the 158 road miles from Redding to Eureka require seven or eight hours. The average private aircraft could cover this distance in approximately one hour.

Most of the goods for local consumption which are not produced locally, are brought in from Sacramento, the Bay Area and southern California. A certain amount of trading in the northern section is carried on with the Oregon cities of Ashland, Medford and Klamath Falls. Improved air transportation would both supplement the present inadequate surface transportation and help bind this Area more solidly with California shopping markets.

Indices of Purchasing Power

The somewhat unfavorable showing made by the Area in comparison with State averages in Table 131, listing various indices of wealth, can probably be attributed mainly to transportation difficulties and the resultant meager development of existing resources. It will be noted, however, that while average State per capita individual incomes increased only 71.11 percent between 1940 and 1945, per capita incomes in this Area increased 84.75 percent during the same period. It should also be observed that per capita automobile registrations in the Area are well over the State average and there is undoubtedly a correlation between interest in owning an automobile and interest in owning an airplane.

TABLE 131
INDICES OF PURCHASING POWER FOR AREA 14
Per Capita Assessed Valuation ^c—1930, 1935, 1940 and 1945

	1930				1935			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Shasta.....	\$25,790,392	\$1,852	103.06	-----	\$34,219,422	\$2,196	201.65	+18.57
Siskiyou.....	31,749,237	1,246	69.34	-----	24,568,895	870	79.89	—30.18
Trinity.....	3,762,561	1,339	74.51	-----	3,797,690	1,181	108.45	—11.80
Totals.....	\$61,302,190	\$1,452	80.80	-----	\$62,586,007	\$1,331	122.22	—8.33
	1940				1945			
	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period	Assessed Valuation	Per Capita Value	Percent California Per Capita	Percent Change from Preceding Period
Shasta.....	\$37,087,741	\$1,288	124.69	—41.35	\$47,961,808	\$1,870	133.19	45.19
Siskiyou.....	26,375,650	922	89.25	5.98	30,768,190	1,089	77.56	18.11
Trinity.....	3,534,480	890	86.16	—24.64	3,588,625	1,148	81.77	28.99
Totals.....	\$66,997,871	\$1,092	105.71	—17.96	\$82,318,623	\$1,444	102.85	32.23

TABLE 131—Continued
 INDICES OF PURCHASING POWER FOR AREA 14
 Deposits of Individuals, Partnerships, and Corporations ^a—1941-1944
 (In thousands of dollars)

	1941		1942		1943		1944	
	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California	Deposits	Percent of California
Shasta.....	\$7,104	.17	\$9,692	.18	\$12,859	.18	\$14,035	.16
Siskiyou.....	8,713	.20	11,267	.20	14,961	.20	18,109	.21
Trinity.....	392	.01	389	.01	510	.01	600	.01
Totals.....	\$16,209	.38	\$21,348	.39	\$28,330	.39	\$32,744	.38

Per Capita Individual Incomes ^b—1940 and 1945

	1940			1945			
	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Individual Incomes (Thousands of dollars)	Per Capita Income	Percent of California Per Capita	Percent Change, 1940 to 1945
Shasta.....	\$14,228	\$494	61.52	\$27,030	\$1,054	76.71	113.36
Siskiyou.....	21,635	757	94.27	36,427	1,289	93.81	70.28
Trinity.....	2,378	599	74.60	2,160	691	50.29	15.36
Totals.....	\$38,241	\$623	77.60	\$65,617	\$1,151	83.77	84.75

Per Capita Retail Sales ^b—1929, 1935, 1939, and 1945

	1929				1935			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Shasta.....	\$6,213	\$446	78.80	-----	\$6,482	\$416	108.62	—6.73
Siskiyou.....	10,945	430	75.97	-----	7,733	274	71.54	—36.28
Trinity.....	538	192	33.92	-----	727	226	59.01	—88.23
Totals.....	\$17,696	\$419	74.03	-----	\$14,942	\$318	83.03	—24.11
	1939				1945			
	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period	Retail Sales (Thousands of dollars)	Per Capita Retail Sales	Percent of California Per Capita	Percent Change from Preceding Period
Shasta.....	\$13,587	\$472	102.39	13.46	\$16,876	\$586	79.30	24.15
Siskiyou.....	11,411	399	86.55	45.62	16,413	574	77.67	43.86
Trinity.....	835	210	45.55	—7.08	1,003	253	34.24	20.48
Totals.....	\$25,833	\$421	91.32	32.39	\$34,292	\$559	75.64	32.78

Source: ^a United States Treasury Department.
^b California State Chamber of Commerce.

^c Statements, Controller's Department.
^d State of California, Division of Motor Vehicles.

TABLE 131—Continued
 INDICES OF PURCHASING POWER—FOR AREA 14
 Per Capita Automobile and Truck Registrations ^d—1930, 1935, 1940, and 1945

	1930				1935			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Shasta.....	5,285	.38	105.56	-----	6,475	.42	120.00	10.53
Siskiyou.....	8,594	.34	94.44	-----	9,160	.32	91.43	-5.88
Trinity.....	760	.27	75.00	-----	1,386	.43	122.86	59.26
Totals.....	14,639	.35	97.22	-----	17,021	.36	102.86	2.86
	1940				1945			
	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period	Auto and Truck Registrations	Per Capita Registrations	Percent California Per Capita	Percent Change from Preceding Period
Shasta.....	13,179	.46	115.00	9.52	9,348	.36	116.13	-21.74
Siskiyou.....	11,776	.41	103.00	28.13	10,117	.36	116.13	-12.20
Trinity.....	1,545	.39	98.00	-9.30	881	.28	90.32	-28.21
Totals.....	26,500	.43	108.00	19.44	20,346	.36	116.13	-16.28

Population

The sparseness of population in Area 14 is brought out by the fact that while the Area embraces eight percent of the total State acreage, it has less than one percent of the population. Table 132 shows that in the decade from 1930 to 1940, the Area's population increased at a slightly greater rate than that of the State. During the war the Area lost population because of migration to industrial centers. It is predicted that the Area will again reach its pre-war population total some time after 1950, and then continue to gain at a

rate comparable with that of the State as a whole. Naturally, any factor that stimulated the economic productivity of the Area would tend to increase the rate of population growth. Table 133 lists the population of the incorporated and unincorporated cities of the Area.

It is believed that this brief survey has proved that the whole economic future of the Shasta-Cascade Area depends on the development of more rapid transportation facilities. The immediate construction of well planned airports will go far towards satisfying the Area's transportation requirements.

TABLE 132
 POPULATION OF AREA 14 BY FIVE-YEAR PERIODS
 1930-1955

	Population	Percent of California	Increase over Preceding Period		Population	Percent of California	Increase over Preceding Period
1930 ^a				1945 ^d			
Shasta.....	13,927	.24	-----	Shasta.....	25,650	.28	-10.94
Siskiyou.....	25,480	.45	-----	Siskiyou.....	28,250	.31	-1.22
Trinity.....	2,809	.05	-----	Trinity.....	3,125	.04	-21.28
Total Area 14.....	42,216	.74	-----	Total Area 14.....	57,025	.63	-7.08
1935 ^b				1950 ^e			
Shasta.....	15,585	.26	11.90	Shasta.....	27,750	.28	8.19
Siskiyou.....	28,235	.46	10.81	Siskiyou.....	29,500	.30	4.42
Trinity.....	3,215	.05	14.45	Trinity.....	3,350	.03	7.20
Total Area 14.....	47,035	.77	11.41	Total Area 14.....	60,600	.61	6.27
1940 ^c				1955 ^f			
Shasta.....	28,800	.42	84.79	Shasta.....	32,525	.29	17.21
Siskiyou.....	28,598	.41	1.29	Siskiyou.....	32,725	.30	10.93
Trinity.....	3,970	.06	23.48	Trinity.....	3,550	.03	5.97
Total Area 14.....	61,368	.89	30.47	Total Area 14.....	68,800	.62	13.53

Source: Same as Table 93, Page 244.

TABLE 133
POPULATION STATISTICS OF AREA 14
Incorporated Places

Aviation Area, Counties Cities	Date Incor- porated	Decennial Census					January, '47 Estimates† or Special Census	Date Taken
		1900	1910	1920	1930	1940		
Area No. 14.....	-----	38,663	41,022	34,457	42,216	61,368	†67,900	-----
Shasta County.....	-----	17,318	18,920	13,361	13,927	28,800	†32,600	-----
*Redding.....	1887	2,946	3,572	2,962	4,188	8,109	-----	-----
Siskiyou County.....	-----	16,962	18,801	18,545	25,480	28,598	†30,300	-----
Dorris.....	1908	-----	214	424	762	863	-----	-----
Dunsmuir.....	1909	-----	1,719	2,528	2,610	2,359	-----	-----
Etna.....	1878	500	518	425	379	456	-----	-----
Fort Jones.....	1872	356	316	331	302	360	-----	-----
Montague.....	1909	-----	274	453	507	463	-----	-----
Mt. Shasta.....	1905	-----	636	542	1,009	1,618	-----	-----
Tulelake.....	1937	-----	-----	-----	-----	785	927	July 19, 1945
Yreka.....	1857	1,254	1,134	1,277	2,126	2,485	-----	-----
Trinity County.....	-----	4,383	3,301	2,551	2,809	3,970	†5,000	-----

* URBAN—1940.

† Estimate of California Taxpayers' Association.

• Unincorporated Places

	Popula- tion		Popula- tion
Shasta County		Siskiyou County	
Anderson.....	1,045	Callahan.....	100
Buckeye.....	525	Edgewood.....	250
Burney.....	500	Gazelle.....	125
Castella.....	650	Grenada.....	350
Central Valley.....	1,776	Happy Camp.....	300
Cottonwood.....	450	Hilt.....	528
Fall River Mills.....	250	Hornbrook.....	350
French Gulch.....	250	Macdoel.....	150
Ingot.....	100	McCloud.....	2,373
Kennett.....	200	Mount Hebron.....	200
Matheson.....	400	Sawyers Bar.....	125
McArthur.....	150	Teenor.....	100
Millville.....	150	Tennant.....	125
Montgomery Creek.....	100	Weed.....	3,897
Pollack.....	130		
Project City.....	564	Trinity County	
Round Mountain.....	125	Carrville.....	150
Shasta.....	250	Hayfork.....	400
Shasta Dam.....	660	Junction City.....	400
Shingletown.....	125	Lewiston.....	200
Summit City.....	971	Weaverville.....	739
Toyon.....	450	Zenia.....	125
Whitmore.....	125		

Source: 1940 Census or later semi-official estimates from *Roster, Public Officials of California*, Secretary of State.

AERONAUTICAL APPRAISAL

The extreme northern tip of the Sacramento Valley loses its identity in southern Shasta County and is terminated by rising elevations in all directions. Trinity County on the west and Siskiyou County on the north are almost totally mountainous, affording no elevations under 2,000 feet. Maximum altitudes range to 9,000 feet in Trinity County; to 14,161 feet is Siskiyou County, culminating in Mt. Shasta; to 10,400 feet

on Lassen Peak in southeastern Shasta County. It is significant that these high elevations are attained from a low of 435 feet in the Anderson Valley below Redding. In spite of the preponderantly mountainous terrain of Area 14, it offers numerous sites adaptable to airport development. The location and classification of existing facilities are listed below:

<i>Plate M-14 Code</i>	<i>City and Airport Name</i>	<i>Ownership</i>	<i>Class</i>
SHASTA COUNTY			
14- 1	Delta—CAA Site 22	CAA	S-1
14-25	Redding Municipal	City of Redding	5
14-26	Redding—Benton Air Park	City of Redding	2
14-50	Anderson—Pinnegar	Commercial-Private	1
14-51	Burney—	Commercial-Private	1
14-52	Fall River Mills—Shasta Sky Ranch	Commercial-Private	1
SISKIYOU COUNTY			
14-10	McCloud—Ash Creek	U. S. F. S.	S-2
14-30	Dunsmuir—Mott Field	County of Siskiyou	1
14-31	Montague—	County of Siskiyou	6
14-32	Montague Municipal	City of Montague	S-2
14-33	Ft. Jones	County of Siskiyou	S-2
14-60	Macdoel	Commercial-Private	S-1
14-61	Weed—Jackson Ranch	Private	1
TRINITY COUNTY			
14-20	Hayfork	U.S.F.S.	1
14-40	Weaverville	County of Trinity	1
14-70	Carrville	Private	S-1
14-71	Minersville	Private	S-1
14-72	Junction City	Private	S-1

At the present time Area 14 is served by Southwest Airways, operating two schedules daily between San Francisco and Medford, Oregon, with stops at Redding, Dunsmuir-Mount Shasta and Yreka. Redding is a pro-

posed stop on the east-west projected route of this air carrier from Eureka-Arcata to Susanville, and the northern projected route—Redding to Klamath Falls, Oregon.

ESTIMATES FOR SCHEDULED AIR TRANSPORT

This Area has an airline passenger potential as shown below (from Table 68, Section 2, Part V) :

	<i>Passenger Potential</i>	
	1950	1955
Dunsmuir	2,829	4,622
Redding	3,890	5,650
Yreka	2,475	3,595
Total Area 14	9,194	13,867

Due to the recent inauguration of air carrier service to Redding, there is no basis yet available for estimating On and Off Passengers Per Trip and these totals cannot be converted into required schedules.

Principal items of agricultural production in Area 14 at the present time do not constitute likely air freight candidates:

		<i>Number of Carloads Shipped Out in 1945</i>	
<i>County</i>	<i>Commodity</i>		<i>Tons</i>
Shasta	Prunes (dried)		4
Siskiyou	Onions		379
	Potatoes (white)		3,463
Trinity	None		—
Total—Area 14			3,846

PRIVATE FLYING ESTIMATES

Based upon a combination of economic buying potential and current private plane per capita ownership, the anticipated private plane ownership for 1950 and 1955 in Area 14 will be distributed as follows:

		<i>Private Plane Ownership</i>	
<i>County</i>	<i>Index</i>	1950	1955
Shasta	91	48	116
Siskiyou	72	42	93
Trinity	84	5	13
Total		95	222

Private plane ownership is distributed to judicial townships within each county based upon the simple economic formula of population and average unit rental set forth in Part V.

SHASTA COUNTY			
<i>Township</i>	<i>Pct.</i>	1950	1955
1	54.77	26	64
2	.50	—	1
3	2.36	1	3
4	22.79	11	26
5	6.27	3	7
6	3.74	2	4
7	3.95	2	5
8	1.92	1	2
9	3.70	2	4

SISKIYOU COUNTY

Township	Pct.	1950	1955
Butte	12.26	5	11
Callahan	.70	-	1
Edgewood	12.27	5	12
Etna	2.33	1	2
Greenview	.56	-	-
Happy Camp	1.05	-	1
Hilt	1.30	1	1
Lake	4.23	2	4
Liberty	.81	-	1
Macdoel	.81	-	1
Mott	17.96	8	17
Mountain	1.39	1	1
Oak Bar	1.25	1	1
Scott River	1.30	1	1

Township	Pct.	1950	1955
Scott Valley	1.90	1	2
Somes Bar	.40	-	-
Squaw Valley	10.10	4	9
Table Rock	2.25	1	2
Tennant	1.04	-	1
Tule Lake	7.17	3	7
Yreka	18.92	8	18

TRINITY COUNTY

Township	Pct.	1950	1955
Hay Fork	12.81	1	2
Junction City	17.35	1	2
Mad River	7.03	-	1
Trinity Center	8.15	-	1
Weaverville	54.66	3	7

AIRPORT REQUIREMENTS

The following paragraphs list communities in Area 14 where existing facilities are considered inadequate or where no facilities presently are located to serve current or anticipated requirements:

SHASTA COUNTY

Manzanita Lake-Viola

This area is the western gateway to the Lassen Volcanic National Park and provision should be made to serve air tourists who wish to visit this National Park, where more than 100,000 visitors registered in 1941 and 95,000 in 1946. A Class 1 airport by 1955 is recommended for a location immediately west of Mount Lassen, which would also serve as an auxiliary field for aircraft flying the natural air route from Fall River Mills to points in the Sacramento Valley via Red Bluff or Chico. Such a facility is recommended in the Shasta County Master Plan of Airports.

Ingot-Round Mountain

The Ingot-Round Mountain section is in the center of a forty mile gap on the natural air route from Redding to Alturas, in very mountainous terrain, nearest fields being Burney on the east and Redding on the west. A Class 1 airport development is recommended in this vicinity by 1950, in the interests of safety, convenience to non-scheduled aircraft, as well as access generally to this relatively isolated area.

Ono-Platina

Relatively isolated in a rugged portion of southwestern Shasta County, the section adjacent to Platina and Ono, as well as Beegum in Tehama County, should eventually be served with airplane landing facilities. The State Division of Forestry has recommended a Class 1 airport at this location, and a similar recommendation is made in the Shasta County Master Plan of Airports. This study concurs in recommending a Class 1 airport for this vicinity by 1955.

SISKIYOU COUNTY

Dunsmuir

The Dunsmuir-Mount Shasta section is presently served by a Class 1 County Airport located four and

one-half miles north of Dunsmuir. This was adequate for the needs of the community prior to the establishment of feeder-line service early in 1947. It is entirely inadequate for the routine operation of transport aircraft. Since this feederline stop serves an area otherwise remote from air transport connections, and since business developed to date indicates the growing need for this service, the immediate improvement of this facility to feederline standards is being recommended in this report. The 1947 National Airport Plan and Program calls for the development of a Class 2 Airport immediately. This should be later expanded to a Class 3, the minimum required for routine feederline operation.

Fort Jones

Located directly on Airway Amber 1, and present site for the Fort Jones radio range, there is a definite need for an airport in this section adequate to serve, not only the Scott Valley region, but as an emergency facility for aircraft flying between Red Bluff and Medford, and the airport requirements of the communities of Etna and Fort Jones. Two airports, one each in the north and south portions of the valley, as proposed by the County, cannot be economically justified during the period covered by this study. The airplane ownership potential for the area tributary to Fort Jones will not of itself justify the construction of improvements necessary to bring this present substandard Class 2 to full Class 2 airport standards by 1950. Its position on Amber Airway No. 1 and the need for making this region accessible to air travelers in other parts of Siskiyou County, is the justification for the recommended development. No other suitable airport exists in this section of the County.

Macdoel-Dorris-Mt. Hebron

These three small communities are in an isolated valley extending from twenty to forty miles south of Klamath Falls, along the route of Amber Airway No. 8, which connects Red Bluff, California, with Klamath Falls, Oregon. An airport located in the vicinity of MacDoel would serve a 1955 potential of approximately fifteen aircraft and provide an emergency landing

facility in an otherwise unprotected section of the civil airway. The existing Private substandard Class 1 facility at MacDoel should ultimately be improved to adequately care for this need. Development of a Class 2 facility in this area is therefore being recommended for 1955.

Happy Camp

Happy Camp, on the Klamath River, is forty air miles west of Yreka, in Siskiyou County. It is a mining community with approximately 300 population, and was principally responsible for Siskiyou's top position in the State's copper production during the war. Surface transportation in the region is difficult and very slow. A Class 2 airport development by 1950 is recommended for the section for the reason that it represents an area of over 500,000 acres outside the service area of any existing airport. Situated as it is in the northern half of the Klamath National Forest, the United States Forest Service is interested in the location of an airport here and has recommended a Class 2 facility.

TRINITY COUNTY

Weaverville

Weaverville is the county seat of Trinity County and the county's largest town, with a population of 1,500. It is also the commercial center of the county and headquarters of the Trinity National Forest. Improvements to bring the present Class 1 facility (county owned) to full Class 1 specifications are included in the 1947 National Airport Plan. The U. S. Forest Service has recommended development of the facility to a Class 2 airport. It is the policy of this study to recommend consideration to adequate airport facilities for county seats in relatively isolated areas. It is believed that an airport of less than Class 2 specifications would be insufficient to adequately care for the needs of this enterprising community, since many of the non-scheduled aircraft in use at the present time, particularly those employed in charter service, require Class 2 airports as minimum for safe operation. All of Trinity County is, to a great extent, dependent upon the airport facilities at Weaverville. To provide less than a Class 2 airport would therefore deprive this large section of the State of non-scheduled air communication. While the development cannot be justified from local requirements, it is unquestionably necessary if all points in California are to be made accessible by air to the traveling public.

Trinity Center

This locality serves a 350,000 acre area of virgin country within the Shasta and Trinity National Forests, including 75,000 acres of the famous Trinity Alps Wilderness Area. There exists sufficient timber land to produce thirty-five million board feet of lumber each year indefinitely, and the possibilities for

recreation and mineral development are almost limitless. The heavily used main north-south Amber 1 airway is beamed three miles east of Trinity Center, which is mid-way between Red Bluff and Fort Jones, a distance of 108 miles over rough mountainous terrain. There are presently no adequate emergency fields between Redding and Medford, Oregon, although this report has recommended improvement of the Fort Jones Airport. A Class 2 Airport should be developed in the vicinity of Trinity Center as such development would provide emergency facilities vitally needed, and halve the distance between Red Bluff and Fort Jones. The United States Forest Service has a primary interest in a field in this locality and has recommended a Class 2 installation at Trinity Center. Recommendation in this report has reference to the development of either the Minersville or Carrville S-1 airports to Class 2 standards, dependent upon the relative cost of such development.

Hayfork

Some of the finest agricultural land in Trinity County, and more level land than in any other section, is found in the Hayfork area. The climate is fairly mild, with little snowfall, and the location is out of the fog belt. The lumber industry is important at Hayfork and this community is the focal point of five large working circles of timber which are to be set on a sustained yield basis. It is recommended that the present Class 1 Airport be expanded to a Class 2 by 1950, and provision should be made for ultimate further expansion since air freight shipments into the area could eventually advantageously augment surface facilities. The U. S. Forest Service has recommended a Class 2 installation at Hayfork.

Salyer

This community is located on the western edge of Trinity County where there is a limited amount of ground fog. It lies between Weaverville and Arcata, in Humboldt County. A Class 1 Airport is recommended here by 1950. The population of the area to be served is relatively small, but the area is the center of excellent steelhead and salmon fishing in both the South Fork of Trinity, Trinity River and their tributaries. Camping, swimming and outdoor recreational activities are well established in the area, with expanding facilities in various stages of development. Lumbering is rapidly becoming an important industry with an ultimate sustained cut estimated at 20 million board feet annually in the Salyer District. The nearest airports at present are Weaverville, fifty-five miles to the east, and Arcata, approximately fifty miles to the west. This is a natural air route between the important Eureka territory on the coast and the cities of the north central valley, and an airport at this location would safeguard non-scheduled flying between these important centers.

Junction City

Located 16 miles west of Weaverville, on the Redding-Eureka air route, Junction City's private Class substandard 1 airport serves this mining area, and furnishes emergency facilities for the region. However, to serve these needs adequately requires a full standard Class 1 at this location. Acres of tailing piles left from bucket line dredge operations could be easily leveled to provide fine drainage and foundation to support an adequate landing strip here. It is the recommendation of this study that either the present substandard facility be improved or a new location chosen for a Class 1 standard airport, dependent upon local conditions and relative costs, by 1950.

Hyampom

Hyampom is located in the most scenic section of central western Trinity County, and is one of the most isolated sections of the entire State because of present difficulties in transportation. Air transportation would definitely provide impetus to the development of the tourist "business" in this section. A Class 1 airport here would also provide emergency facilities for air travel between Redding and Eureka via Hayfork, and the development of such facility is recommended by 1950.

Lewiston

This small mining community is directly on the air route between Redding and Eureka via Weaverville

and Junction City. The interests of safety to non-scheduled aircraft would justify a flight strip at this location; however, there is the construction of the proposed Fairview Dam to be considered too, as this development would result in a constant level lake eight miles long, furnishing water for Sacramento Valley irrigation, and for power and flood control purposes. Construction of this dam would present an immediate need for an airport in close proximity to the project. A Class 1 airport is recommended for the Lewiston locality by 1955.

Island Mountain

Located in the extreme southwestern corner of Trinity County, the community of Lake Mountain borders on Humboldt and Mendocino Counties. It is on a natural air route between Suisun and Arcata. With adequate transportation, this area might well become of great recreational value as the hunting is particularly fine in this remote section. During the winter months poor roads are made practically impassable by rain, snow and ice. Development of a Class 1 Airport here would provide an emergency field for planes flying this natural airway, as well as furnish improved transportation facilities to the region. Too, it would assist in unifying all sections of this sparsely populated county as under present transportation conditions, residents of the area have closer contact with Humboldt and Mendocino Counties than with other sections of Trinity County. A Class 1 facility is recommended for this locality by 1955.

SUMMARY OF AREA TREATMENT AND RECOMMENDED AIRPORT DEVELOPMENT—AREA 14

AE—Airline, Existing
AP—Airline, Projected
FE—Feederline, Existing
FP—Feederline, Projected

C—Cargo, Projected
R—Recreational
FS—Forest Services
NS—Nonscheduled and Private

General Location	Existing Airport(s)			Recommended Development*			
	Name	Category	Class	1950	Basis	1955	Basis
Shasta County							
Ingot-Round Mountain				1	NS		
Ono-Platina						1	FS,NS
Manzanita Lake-Viola						1	R,NS,FS
Siskiyou County							
Dunsmuir	Mott	County	1	2	FE,R,FS,NS	3	FE,R,FS,NS
Fort Jones		County	S-2	2	R,FS,NS		
Dorris-Macdoel		Private	S-1			2	R,NS
Happy Camp				2	R,FS,NS		
Trinity County							
Weaverville		County	1	2	FS,NS		
Trinity Center		(Private)	(S-1)	2	R,FS,NS		
Hayfork		USFS	1	2	R,FS,NS		
Salzer				1	R,NS		
Junction City		(Private)	(S-1)	1	NS		
Lewiston						1	R,NS
Island Mountain						1	R,FS,NS
Hyampom				1	R,NS		

* Unless otherwise noted, no additional development required by 1955 if 1950 recommendations are accomplished.

() Where bracketed existing private airports are not included in civil airport count.

6-11-49

629.136

C153c2

UNIVERSITY OF FLORIDA



3 1262 09364 9431